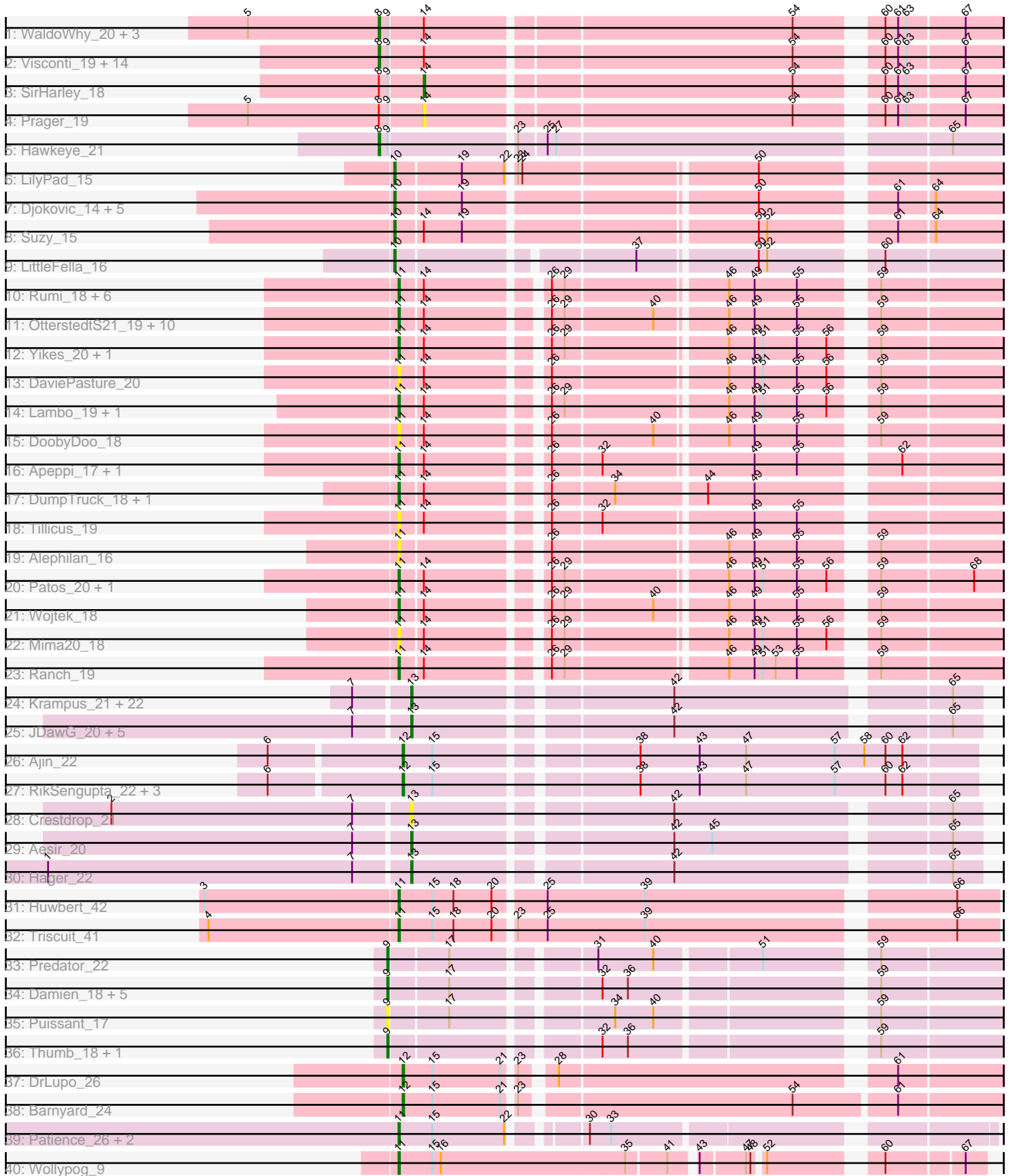


Pham 171306



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 171306 Report

This analysis was run 07/10/24 on database version 566.

Pham number 171306 has 121 members, 20 are drafts.

Phages represented in each track:

- Track 1 : WaldoWhy\_20, Chill\_20, Delton\_19, BigMama\_17
- Track 2 : Visconti\_19, KandZ\_19, Gumball\_18, Thoth\_19, Nova\_19, PLOT\_20, Adjutor\_20, Penelope2018\_19, Troll4\_19, Erk16\_19, Giuseppe\_19, Butterscotch\_19, Mopey\_19, Helpful\_20, PBI1\_20
- Track 3 : SirHarley\_18
- Track 4 : Prager\_19
- Track 5 : Hawkeye\_21
- Track 6 : LilyPad\_15
- Track 7 : Djokovic\_14, Madi\_14, Terapin\_14, BiteSize\_14, Sienna\_14, Beyoncage\_14
- Track 8 : Suzy\_15
- Track 9 : LittleFella\_16
- Track 10 : Rumi\_18, Alyssamiracle\_18, Genamy16\_18, Avian\_17, Zany\_18, NovaSharks\_18, Jamemuya19\_16
- Track 11 : OtterstedtS21\_19, Gibbin\_20, Sampudon\_19, Lila22\_20, GretelLyn\_19, MoiGyank\_20, Fulcrum\_20, Sadboi\_19, Jalebi\_19, BirthdayBoy\_20, GOATification\_20
- Track 12 : Yikes\_20, ParvusTarda\_19
- Track 13 : DaviePasture\_20
- Track 14 : Lambo\_19, Erutan\_19
- Track 15 : DoobyDoo\_18
- Track 16 : Apeppi\_17, LuckyLeo\_18
- Track 17 : DumpTruck\_18, Xenia2\_16
- Track 18 : Tillicus\_19
- Track 19 : Alephilan\_16
- Track 20 : Patos\_20, NorManre\_20
- Track 21 : Wojtek\_18
- Track 22 : Mima20\_18
- Track 23 : Ranch\_19
- Track 24 : Krampus\_21, Hiddenleaf\_20, Neptune\_21, Pharpay\_21, Gilda\_21, Anakin\_21, Rachella\_21, DannyDe\_20, Poultruss\_20, Haunter\_21, Kate\_21, AnnaSerena\_21, CoolCookie\_25, FreddieHg\_20, Potty\_21, Tedro\_21, JingleBells\_20, Cybele\_21, OverHedge\_21, NarutoRun\_21, Chivey\_20, PhunaPhoke\_21, Snakehole\_22
- Track 25 : JDawG\_20, Dauntless\_21, Rie18\_21, MortySmith\_19, Karate\_20, Erudite\_20
- Track 26 : Ajin\_22

- Track 27 : RikSengupta\_22, TinyMiny\_22, Kors\_23, Sparcetus\_22
- Track 28 : Crestdrop\_21
- Track 29 : Aesir\_20
- Track 30 : Hager\_22
- Track 31 : Huwbert\_42
- Track 32 : Triscuit\_41
- Track 33 : Predator\_22
- Track 34 : Damien\_18, Cborch11\_19, Phreeze\_18, Konstantine\_23, Beckerton\_18, Oaker\_18
- Track 35 : Puissant\_17
- Track 36 : Thumb\_18, Megatron06\_20
- Track 37 : DrLupo\_26
- Track 38 : Barnyard\_24
- Track 39 : Patience\_26, Labelle\_25, Madruga\_24
- Track 40 : Wollypog\_9

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

The start number called the most often in the published annotations is 11, it was called in 30 of the 101 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Alephilan\_16, Alyssamiracle\_18, Apeppi\_17, Avian\_17, BirthdayBoy\_20, DaviePasture\_20, DoobyDoo\_18, DumpTruck\_18, Erutan\_19, Fulcrum\_20, GOATification\_20, Genamy16\_18, Gibbin\_20, Gretellyn\_19, Huwbert\_42, Jalebi\_19, Jamemuya19\_16, Labelle\_25, Lambo\_19, Lila22\_20, LuckyLeo\_18, Madruga\_24, Mima20\_18, MoiGyank\_20, NorManre\_20, NovaSharks\_18, OtterstedtS21\_19, ParvusTarda\_19, Patience\_26, Patos\_20, Ranch\_19, Rumi\_18, Sadboi\_19, Sampudon\_19, Tillicus\_19, Triscuit\_41, Wojtek\_18, Wollypog\_9, Xenia2\_16, Yikes\_20, Zany\_18,

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

- 

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

- Adjutor\_20, Aesir\_20, Ajin\_22, Anakin\_21, AnnaSerena\_21, Barnyard\_24, Beckerton\_18, Beyoncage\_14, BigMama\_17, BiteSize\_14, Butterscotch\_19, Cborch11\_19, Chill\_20, Chivey\_20, CoolCookie\_25, Crestdrop\_21, Cybele\_21, Damien\_18, DannyDe\_20, Dauntless\_21, Delton\_19, Djokovic\_14, DrLupo\_26, Erk16\_19, Erudite\_20, FreddieHg\_20, Gilda\_21, Giuseppe\_19, Gumball\_18, Hager\_22, Haunter\_21, Hawkeye\_21, Helpful\_20, Hiddenleaf\_20, JDawG\_20, JingleBells\_20, KandZ\_19, Karate\_20, Kate\_21, Konstantine\_23, Kors\_23, Krampus\_21, LilyPad\_15, LittleFella\_16, Madi\_14, Megatron06\_20, Mopey\_19, MortySmith\_19, NarutoRun\_21, Neptune\_21, Nova\_19, Oaker\_18, OverHedge\_21, PBl1\_20, PLOT\_20, Penelope2018\_19, Pharpay\_21, Phreeze\_18, PhunaPhoke\_21, Potty\_21, Poultruss\_20, Prager\_19, Predator\_22, Puissant\_17, Rachella\_21, Rie18\_21, RikSengupta\_22, Sienna\_14, SirHarley\_18, Snakehole\_22, Sparcetus\_22, Suzy\_15, Tedro\_21, Terapin\_14, Thoth\_19, Thumb\_18, TinyMiny\_22, Troll4\_19, Visconti\_19, WaldoWhy\_20,

## Summary by start number:

### Start 8:

- Found in 22 of 121 ( 18.2% ) of genes in pham
- Manual Annotations of this start: 20 of 101
- Called 90.9% of time when present
- Phage (with cluster) where this start called: Adjutor\_20 (D1), BigMama\_17 (D1), Butterscotch\_19 (D1), Chill\_20 (D1), Delton\_19 (D1), Erk16\_19 (D1), Giuseppe\_19 (D1), Gumball\_18 (D1), Hawkeye\_21 (D2), Helpful\_20 (D1), KandZ\_19 (D1), Mopey\_19 (D1), Nova\_19 (D1), PBI1\_20 (D1), PLOT\_20 (D1), Penelope2018\_19 (D1), Thoth\_19 (D1), Troll4\_19 (D1), Visconti\_19 (D1), WaldoWhy\_20 (D1),

### Start 9:

- Found in 32 of 121 ( 26.4% ) of genes in pham
- Manual Annotations of this start: 9 of 101
- Called 31.2% of time when present
- Phage (with cluster) where this start called: Beckerton\_18 (H1), Cborch11\_19 (H1), Damien\_18 (H1), Konstantine\_23 (H1), Megatron06\_20 (H1), Oaker\_18 (H1), Phreeze\_18 (H1), Predator\_22 (H1), Puissant\_17 (H1), Thumb\_18 (H1),

### Start 10:

- Found in 9 of 121 ( 7.4% ) of genes in pham
- Manual Annotations of this start: 9 of 101
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Beyoncage\_14 (DG1), BiteSize\_14 (DG1), Djokovic\_14 (DG1), LilyPad\_15 (DG1), LittleFella\_16 (DG2), Madi\_14 (DG1), Sienna\_14 (DG1), Suzy\_15 (DG1), Terapin\_14 (DG1),

### Start 11:

- Found in 41 of 121 ( 33.9% ) of genes in pham
- Manual Annotations of this start: 30 of 101
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Alephilan\_16 (DV), Alyssmiracle\_18 (DV), Apeppi\_17 (DV), Avian\_17 (DV), BirthdayBoy\_20 (DV), DaviePasture\_20 (DV), DoobyDoo\_18 (DV), DumpTruck\_18 (DV), Erutan\_19 (DV), Fulcrum\_20 (DV), GOATification\_20 (DV), Genamy16\_18 (DV), Gibbin\_20 (DV), GretelLyn\_19 (DV), Huwbert\_42 (GG), Jalebi\_19 (DV), Jamemuya19\_16 (DV), Labelle\_25 (U), Lambo\_19 (DV), Lila22\_20 (DV), LuckyLeo\_18 (DV), Madruga\_24 (U), Mima20\_18 (DV), MoiGyank\_20 (DV), NorManre\_20 (DV), NovaSharks\_18 (DV), OtterstedtS21\_19 (DV), ParvusTarda\_19 (DV), Patience\_26 (U), Patos\_20 (DV), Ranch\_19 (DV), Rumi\_18 (DV), Sadboi\_19 (DV), Sampudon\_19 (DV), Tillicus\_19 (DV), Triscuit\_41 (GG), Wojtek\_18 (DV), Wollypog\_9 (singleton), Xenia2\_16 (DV), Yikes\_20 (DV), Zany\_18 (DV),

### Start 12:

- Found in 7 of 121 ( 5.8% ) of genes in pham
- Manual Annotations of this start: 6 of 101
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Ajin\_22 (EF), Barnyard\_24 (H2), DrLupo\_26 (H2), Kors\_23 (EF), RikSengupta\_22 (EF), Sparcetus\_22 (EF), TinyMiny\_22 (EF),

### Start 13:

- Found in 32 of 121 ( 26.4% ) of genes in pham
- Manual Annotations of this start: 26 of 101
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aesir\_20 (EF), Anakin\_21 (EF), AnnaSerena\_21 (EF), Chivey\_20 (EF), CoolCookie\_25 (EF), Crestdrop\_21 (EF), Cybele\_21 (EF), DannyDe\_20 (EF), Dauntless\_21 (EF), Erudite\_20 (EF), FreddieHg\_20 (EF), Gilda\_21 (EF), Hager\_22 (EF), Haunter\_21 (EF), Hiddenleaf\_20 (EF), JDawG\_20 (EF), JingleBells\_20 (EF), Karate\_20 (EF), Kate\_21 (EF), Krampus\_21 (EF), MortySmith\_19 (EF), NarutoRun\_21 (EF), Neptune\_21 (EF), OverHedge\_21 (EF), Pharpay\_21 (EF), PhunaPhoke\_21 (EF), Potty\_21 (EF), Poultruss\_20 (EF), Rachella\_21 (EF), Rie18\_21 (EF), Snakehole\_22 (EF), Tedro\_21 (EF),

Start 14:

- Found in 56 of 121 ( 46.3% ) of genes in pham
- Manual Annotations of this start: 1 of 101
- Called 3.6% of time when present
- Phage (with cluster) where this start called: Prager\_19 (D1), SirHarley\_18 (D1),

### **Summary by clusters:**

There are 11 clusters represented in this pham: DG2, singleton, H1, H2, EF, GG, DG1, U, DV, D2, D1,

Info for manual annotations of cluster D1:

- Start number 8 was manually annotated 19 times for cluster D1.
- Start number 14 was manually annotated 1 time for cluster D1.

Info for manual annotations of cluster D2:

- Start number 8 was manually annotated 1 time for cluster D2.

Info for manual annotations of cluster DG1:

- Start number 10 was manually annotated 8 times for cluster DG1.

Info for manual annotations of cluster DG2:

- Start number 10 was manually annotated 1 time for cluster DG2.

Info for manual annotations of cluster DV:

- Start number 11 was manually annotated 24 times for cluster DV.

Info for manual annotations of cluster EF:

- Start number 12 was manually annotated 4 times for cluster EF.
- Start number 13 was manually annotated 26 times for cluster EF.

Info for manual annotations of cluster GG:

- Start number 11 was manually annotated 2 times for cluster GG.

Info for manual annotations of cluster H1:

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

Info for manual annotations of cluster H2:

- Start number 12 was manually annotated 2 times for cluster H2.

Info for manual annotations of cluster U:

•Start number 11 was manually annotated 3 times for cluster U.

**Gene Information:**

Gene: Adjutor\_20 Start: 12729, Stop: 13136, Start Num: 8

Candidate Starts for Adjutor\_20:

(Start: 8 @12729 has 20 MA's), (Start: 9 @12735 has 9 MA's), (Start: 14 @12759 has 1 MA's), (54, 13008), (60, 13056), (61, 13065), (63, 13071), (67, 13110),

Gene: Aesir\_20 Start: 11440, Stop: 11808, Start Num: 13

Candidate Starts for Aesir\_20:

(7, 11404), (Start: 13 @11440 has 26 MA's), (42, 11608), (45, 11635), (65, 11788),

Gene: Ajin\_22 Start: 11605, Stop: 11991, Start Num: 12

Candidate Starts for Ajin\_22:

(6, 11515), (Start: 12 @11605 has 6 MA's), (15, 11626), (38, 11755), (43, 11797), (47, 11830), (57, 11893), (58, 11914), (60, 11929), (62, 11941),

Gene: Alephilan\_16 Start: 13251, Stop: 13628, Start Num: 11

Candidate Starts for Alephilan\_16:

(Start: 11 @13251 has 30 MA's), (26, 13341), (46, 13455), (49, 13473), (55, 13503), (59, 13545),

Gene: Alyssamiracle\_18 Start: 11658, Stop: 12035, Start Num: 11

Candidate Starts for Alyssamiracle\_18:

(Start: 11 @11658 has 30 MA's), (Start: 14 @11673 has 1 MA's), (26, 11748), (29, 11757), (46, 11862), (49, 11880), (55, 11910), (59, 11952),

Gene: Anakin\_21 Start: 11650, Stop: 12018, Start Num: 13

Candidate Starts for Anakin\_21:

(7, 11614), (Start: 13 @11650 has 26 MA's), (42, 11818), (65, 11998),

Gene: AnnaSerena\_21 Start: 11659, Stop: 12027, Start Num: 13

Candidate Starts for AnnaSerena\_21:

(7, 11623), (Start: 13 @11659 has 26 MA's), (42, 11827), (65, 12007),

Gene: Apeppi\_17 Start: 13373, Stop: 13750, Start Num: 11

Candidate Starts for Apeppi\_17:

(Start: 11 @13373 has 30 MA's), (Start: 14 @13388 has 1 MA's), (26, 13463), (32, 13496), (49, 13595), (55, 13625), (62, 13682),

Gene: Avian\_17 Start: 11658, Stop: 12035, Start Num: 11

Candidate Starts for Avian\_17:

(Start: 11 @11658 has 30 MA's), (Start: 14 @11673 has 1 MA's), (26, 11748), (29, 11757), (46, 11862), (49, 11880), (55, 11910), (59, 11952),

Gene: Barnyard\_24 Start: 14273, Stop: 14668, Start Num: 12

Candidate Starts for Barnyard\_24:

(Start: 12 @14273 has 6 MA's), (15, 14294), (21, 14342), (23, 14348), (54, 14528), (61, 14597),

Gene: Beckerton\_18 Start: 13163, Stop: 13546, Start Num: 9

Candidate Starts for Beckerton\_18:

(Start: 9 @13163 has 9 MA's), (17, 13202), (32, 13292), (36, 13310), (59, 13463),

Gene: Beyoncage\_14 Start: 9137, Stop: 9526, Start Num: 10

Candidate Starts for Beyoncage\_14:

(Start: 10 @9137 has 9 MA's), (19, 9182), (50, 9374), (61, 9455), (64, 9479),

Gene: BigMama\_17 Start: 12805, Stop: 13212, Start Num: 8

Candidate Starts for BigMama\_17:

(5, 12712), (Start: 8 @12805 has 20 MA's), (Start: 9 @12811 has 9 MA's), (Start: 14 @12835 has 1 MA's), (54, 13084), (60, 13132), (61, 13141), (63, 13147), (67, 13186),

Gene: BirthdayBoy\_20 Start: 14104, Stop: 14481, Start Num: 11

Candidate Starts for BirthdayBoy\_20:

(Start: 11 @14104 has 30 MA's), (Start: 14 @14119 has 1 MA's), (26, 14194), (29, 14203), (40, 14263), (46, 14308), (49, 14326), (55, 14356), (59, 14398),

Gene: BiteSize\_14 Start: 9137, Stop: 9526, Start Num: 10

Candidate Starts for BiteSize\_14:

(Start: 10 @9137 has 9 MA's), (19, 9182), (50, 9374), (61, 9455), (64, 9479),

Gene: Butterscotch\_19 Start: 12789, Stop: 13196, Start Num: 8

Candidate Starts for Butterscotch\_19:

(Start: 8 @12789 has 20 MA's), (Start: 9 @12795 has 9 MA's), (Start: 14 @12819 has 1 MA's), (54, 13068), (60, 13116), (61, 13125), (63, 13131), (67, 13170),

Gene: Cborch11\_19 Start: 12626, Stop: 13009, Start Num: 9

Candidate Starts for Cborch11\_19:

(Start: 9 @12626 has 9 MA's), (17, 12665), (32, 12755), (36, 12773), (59, 12926),

Gene: Chill\_20 Start: 12795, Stop: 13202, Start Num: 8

Candidate Starts for Chill\_20:

(5, 12702), (Start: 8 @12795 has 20 MA's), (Start: 9 @12801 has 9 MA's), (Start: 14 @12825 has 1 MA's), (54, 13074), (60, 13122), (61, 13131), (63, 13137), (67, 13176),

Gene: Chivey\_20 Start: 10852, Stop: 11220, Start Num: 13

Candidate Starts for Chivey\_20:

(7, 10816), (Start: 13 @10852 has 26 MA's), (42, 11020), (65, 11200),

Gene: CoolCookie\_25 Start: 11657, Stop: 12025, Start Num: 13

Candidate Starts for CoolCookie\_25:

(7, 11621), (Start: 13 @11657 has 26 MA's), (42, 11825), (65, 12005),

Gene: Crestdrop\_21 Start: 10726, Stop: 11094, Start Num: 13

Candidate Starts for Crestdrop\_21:

(2, 10519), (7, 10690), (Start: 13 @10726 has 26 MA's), (42, 10894), (65, 11074),

Gene: Cybele\_21 Start: 11627, Stop: 11995, Start Num: 13

Candidate Starts for Cybele\_21:

(7, 11591), (Start: 13 @11627 has 26 MA's), (42, 11795), (65, 11975),

Gene: Damien\_18 Start: 12625, Stop: 13008, Start Num: 9

Candidate Starts for Damien\_18:

(Start: 9 @12625 has 9 MA's), (17, 12664), (32, 12754), (36, 12772), (59, 12925),

Gene: DannyDe\_20 Start: 10844, Stop: 11212, Start Num: 13

Candidate Starts for DannyDe\_20:

(7, 10808), (Start: 13 @10844 has 26 MA's), (42, 11012), (65, 11192),

Gene: Dauntless\_21 Start: 11369, Stop: 11737, Start Num: 13

Candidate Starts for Dauntless\_21:

(7, 11333), (Start: 13 @11369 has 26 MA's), (42, 11537), (65, 11717),

Gene: DaviePasture\_20 Start: 13861, Stop: 14238, Start Num: 11

Candidate Starts for DaviePasture\_20:

(Start: 11 @13861 has 30 MA's), (Start: 14 @13876 has 1 MA's), (26, 13951), (46, 14065), (49, 14083), (51, 14089), (55, 14113), (56, 14134), (59, 14155),

Gene: Delton\_19 Start: 12801, Stop: 13208, Start Num: 8

Candidate Starts for Delton\_19:

(5, 12708), (Start: 8 @12801 has 20 MA's), (Start: 9 @12807 has 9 MA's), (Start: 14 @12831 has 1 MA's), (54, 13080), (60, 13128), (61, 13137), (63, 13143), (67, 13182),

Gene: Djokovic\_14 Start: 9137, Stop: 9526, Start Num: 10

Candidate Starts for Djokovic\_14:

(Start: 10 @9137 has 9 MA's), (19, 9182), (50, 9374), (61, 9455), (64, 9479),

Gene: DoobyDoo\_18 Start: 13038, Stop: 13415, Start Num: 11

Candidate Starts for DoobyDoo\_18:

(Start: 11 @13038 has 30 MA's), (Start: 14 @13053 has 1 MA's), (26, 13128), (40, 13197), (46, 13242), (49, 13260), (55, 13290), (59, 13332),

Gene: DrLupo\_26 Start: 14684, Stop: 15067, Start Num: 12

Candidate Starts for DrLupo\_26:

(Start: 12 @14684 has 6 MA's), (15, 14705), (21, 14753), (23, 14759), (28, 14777), (61, 14996),

Gene: DumpTruck\_18 Start: 13292, Stop: 13672, Start Num: 11

Candidate Starts for DumpTruck\_18:

(Start: 11 @13292 has 30 MA's), (Start: 14 @13307 has 1 MA's), (26, 13382), (34, 13424), (44, 13484), (49, 13517),

Gene: Erk16\_19 Start: 12792, Stop: 13199, Start Num: 8

Candidate Starts for Erk16\_19:

(Start: 8 @12792 has 20 MA's), (Start: 9 @12798 has 9 MA's), (Start: 14 @12822 has 1 MA's), (54, 13071), (60, 13119), (61, 13128), (63, 13134), (67, 13173),

Gene: Erudite\_20 Start: 11369, Stop: 11737, Start Num: 13

Candidate Starts for Erudite\_20:

(7, 11333), (Start: 13 @11369 has 26 MA's), (42, 11537), (65, 11717),

Gene: Erutan\_19 Start: 13551, Stop: 13928, Start Num: 11

Candidate Starts for Erutan\_19:

(Start: 11 @13551 has 30 MA's), (Start: 14 @13566 has 1 MA's), (26, 13641), (29, 13650), (46, 13755), (49, 13773), (51, 13779), (55, 13803), (56, 13824), (59, 13845),

Gene: FreddieHg\_20 Start: 10868, Stop: 11236, Start Num: 13



Candidate Starts for FreddieHg\_20:

(7, 10832), (Start: 13 @10868 has 26 MA's), (42, 11036), (65, 11216),

Gene: Fulcrum\_20 Start: 14084, Stop: 14461, Start Num: 11

Candidate Starts for Fulcrum\_20:

(Start: 11 @14084 has 30 MA's), (Start: 14 @14099 has 1 MA's), (26, 14174), (29, 14183), (40, 14243), (46, 14288), (49, 14306), (55, 14336), (59, 14378),

Gene: GOATification\_20 Start: 14084, Stop: 14461, Start Num: 11

Candidate Starts for GOATification\_20:

(Start: 11 @14084 has 30 MA's), (Start: 14 @14099 has 1 MA's), (26, 14174), (29, 14183), (40, 14243), (46, 14288), (49, 14306), (55, 14336), (59, 14378),

Gene: Genamy16\_18 Start: 11658, Stop: 12035, Start Num: 11

Candidate Starts for Genamy16\_18:

(Start: 11 @11658 has 30 MA's), (Start: 14 @11673 has 1 MA's), (26, 11748), (29, 11757), (46, 11862), (49, 11880), (55, 11910), (59, 11952),

Gene: Gibbin\_20 Start: 14144, Stop: 14521, Start Num: 11

Candidate Starts for Gibbin\_20:

(Start: 11 @14144 has 30 MA's), (Start: 14 @14159 has 1 MA's), (26, 14234), (29, 14243), (40, 14303), (46, 14348), (49, 14366), (55, 14396), (59, 14438),

Gene: Gilda\_21 Start: 11651, Stop: 12019, Start Num: 13

Candidate Starts for Gilda\_21:

(7, 11615), (Start: 13 @11651 has 26 MA's), (42, 11819), (65, 11999),

Gene: Giuseppe\_19 Start: 12781, Stop: 13188, Start Num: 8

Candidate Starts for Giuseppe\_19:

(Start: 8 @12781 has 20 MA's), (Start: 9 @12787 has 9 MA's), (Start: 14 @12811 has 1 MA's), (54, 13060), (60, 13108), (61, 13117), (63, 13123), (67, 13162),

Gene: Gretellyn\_19 Start: 14418, Stop: 14795, Start Num: 11

Candidate Starts for Gretellyn\_19:

(Start: 11 @14418 has 30 MA's), (Start: 14 @14433 has 1 MA's), (26, 14508), (29, 14517), (40, 14577), (46, 14622), (49, 14640), (55, 14670), (59, 14712),

Gene: Gumball\_18 Start: 12739, Stop: 13146, Start Num: 8

Candidate Starts for Gumball\_18:

(Start: 8 @12739 has 20 MA's), (Start: 9 @12745 has 9 MA's), (Start: 14 @12769 has 1 MA's), (54, 13018), (60, 13066), (61, 13075), (63, 13081), (67, 13120),

Gene: Hager\_22 Start: 11222, Stop: 11590, Start Num: 13

Candidate Starts for Hager\_22:

(1, 10970), (7, 11186), (Start: 13 @11222 has 26 MA's), (42, 11390), (65, 11570),

Gene: Haunter\_21 Start: 11064, Stop: 11432, Start Num: 13

Candidate Starts for Haunter\_21:

(7, 11028), (Start: 13 @11064 has 26 MA's), (42, 11232), (65, 11412),

Gene: Hawkeye\_21 Start: 12664, Stop: 13071, Start Num: 8

Candidate Starts for Hawkeye\_21:

(Start: 8 @12664 has 20 MA's), (Start: 9 @12670 has 9 MA's), (23, 12754), (25, 12772), (27, 12778), (65, 13036),

Gene: Helpful\_20 Start: 12789, Stop: 13196, Start Num: 8

Candidate Starts for Helpful\_20:

(Start: 8 @12789 has 20 MA's), (Start: 9 @12795 has 9 MA's), (Start: 14 @12819 has 1 MA's), (54, 13068), (60, 13116), (61, 13125), (63, 13131), (67, 13170),

Gene: Hiddenleaf\_20 Start: 10852, Stop: 11220, Start Num: 13

Candidate Starts for Hiddenleaf\_20:

(7, 10816), (Start: 13 @10852 has 26 MA's), (42, 11020), (65, 11200),

Gene: Huwbert\_42 Start: 21947, Stop: 22348, Start Num: 11

Candidate Starts for Huwbert\_42:

(3, 21812), (Start: 11 @21947 has 30 MA's), (15, 21971), (18, 21986), (20, 22013), (25, 22046), (39, 22115), (66, 22319),

Gene: JDawG\_20 Start: 11434, Stop: 11802, Start Num: 13

Candidate Starts for JDawG\_20:

(7, 11398), (Start: 13 @11434 has 26 MA's), (42, 11602), (65, 11782),

Gene: Jalebi\_19 Start: 14594, Stop: 14971, Start Num: 11

Candidate Starts for Jalebi\_19:

(Start: 11 @14594 has 30 MA's), (Start: 14 @14609 has 1 MA's), (26, 14684), (29, 14693), (40, 14753), (46, 14798), (49, 14816), (55, 14846), (59, 14888),

Gene: Jamemuya19\_16 Start: 11658, Stop: 12035, Start Num: 11

Candidate Starts for Jamemuya19\_16:

(Start: 11 @11658 has 30 MA's), (Start: 14 @11673 has 1 MA's), (26, 11748), (29, 11757), (46, 11862), (49, 11880), (55, 11910), (59, 11952),

Gene: JingleBells\_20 Start: 10933, Stop: 11301, Start Num: 13

Candidate Starts for JingleBells\_20:

(7, 10897), (Start: 13 @10933 has 26 MA's), (42, 11101), (65, 11281),

Gene: KandZ\_19 Start: 12889, Stop: 13296, Start Num: 8

Candidate Starts for KandZ\_19:

(Start: 8 @12889 has 20 MA's), (Start: 9 @12895 has 9 MA's), (Start: 14 @12919 has 1 MA's), (54, 13168), (60, 13216), (61, 13225), (63, 13231), (67, 13270),

Gene: Karate\_20 Start: 11072, Stop: 11440, Start Num: 13

Candidate Starts for Karate\_20:

(7, 11036), (Start: 13 @11072 has 26 MA's), (42, 11240), (65, 11420),

Gene: Kate\_21 Start: 11659, Stop: 12027, Start Num: 13

Candidate Starts for Kate\_21:

(7, 11623), (Start: 13 @11659 has 26 MA's), (42, 11827), (65, 12007),

Gene: Konstantine\_23 Start: 13827, Stop: 14210, Start Num: 9

Candidate Starts for Konstantine\_23:

(Start: 9 @13827 has 9 MA's), (17, 13866), (32, 13956), (36, 13974), (59, 14127),

Gene: Kors\_23 Start: 11651, Stop: 12037, Start Num: 12

Candidate Starts for Kors\_23:

(6, 11561), (Start: 12 @11651 has 6 MA's), (15, 11672), (38, 11801), (43, 11843), (47, 11876), (57, 11939), (60, 11975), (62, 11987),

Gene: Krampus\_21 Start: 11657, Stop: 12025, Start Num: 13

Candidate Starts for Krampus\_21:

(7, 11621), (Start: 13 @11657 has 26 MA's), (42, 11825), (65, 12005),

Gene: Labelle\_25 Start: 15831, Stop: 16202, Start Num: 11

Candidate Starts for Labelle\_25:

(Start: 11 @15831 has 30 MA's), (15, 15855), (22, 15906), (30, 15945), (33, 15960),

Gene: Lambo\_19 Start: 14088, Stop: 14465, Start Num: 11

Candidate Starts for Lambo\_19:

(Start: 11 @14088 has 30 MA's), (Start: 14 @14103 has 1 MA's), (26, 14178), (29, 14187), (46, 14292), (49, 14310), (51, 14316), (55, 14340), (56, 14361), (59, 14382),

Gene: Lila22\_20 Start: 14042, Stop: 14419, Start Num: 11

Candidate Starts for Lila22\_20:

(Start: 11 @14042 has 30 MA's), (Start: 14 @14057 has 1 MA's), (26, 14132), (29, 14141), (40, 14201), (46, 14246), (49, 14264), (55, 14294), (59, 14336),

Gene: LilyPad\_15 Start: 9856, Stop: 10245, Start Num: 10

Candidate Starts for LilyPad\_15:

(Start: 10 @9856 has 9 MA's), (19, 9901), (22, 9931), (23, 9934), (24, 9937), (50, 10093),

Gene: LittleFella\_16 Start: 11757, Stop: 12137, Start Num: 10

Candidate Starts for LittleFella\_16:

(Start: 10 @11757 has 9 MA's), (37, 11907), (50, 11985), (52, 11991), (60, 12057),

Gene: LuckyLeo\_18 Start: 13373, Stop: 13750, Start Num: 11

Candidate Starts for LuckyLeo\_18:

(Start: 11 @13373 has 30 MA's), (Start: 14 @13388 has 1 MA's), (26, 13463), (32, 13496), (49, 13595), (55, 13625), (62, 13682),

Gene: Madi\_14 Start: 9137, Stop: 9526, Start Num: 10

Candidate Starts for Madi\_14:

(Start: 10 @9137 has 9 MA's), (19, 9182), (50, 9374), (61, 9455), (64, 9479),

Gene: Madruga\_24 Start: 15500, Stop: 15871, Start Num: 11

Candidate Starts for Madruga\_24:

(Start: 11 @15500 has 30 MA's), (15, 15524), (22, 15575), (30, 15614), (33, 15629),

Gene: Megatron06\_20 Start: 13160, Stop: 13543, Start Num: 9

Candidate Starts for Megatron06\_20:

(Start: 9 @13160 has 9 MA's), (32, 13289), (36, 13307), (59, 13460),

Gene: Mima20\_18 Start: 13771, Stop: 14148, Start Num: 11

Candidate Starts for Mima20\_18:

(Start: 11 @13771 has 30 MA's), (Start: 14 @13786 has 1 MA's), (26, 13861), (29, 13870), (46, 13975), (49, 13993), (51, 13999), (55, 14023), (56, 14044), (59, 14065),

Gene: MoiGyank\_20 Start: 14455, Stop: 14832, Start Num: 11

Candidate Starts for MoiGyank\_20:

(Start: 11 @14455 has 30 MA's), (Start: 14 @14470 has 1 MA's), (26, 14545), (29, 14554), (40, 14614), (46, 14659), (49, 14677), (55, 14707), (59, 14749),

Gene: Mopey\_19 Start: 12789, Stop: 13196, Start Num: 8

Candidate Starts for Mopey\_19:

(Start: 8 @12789 has 20 MA's), (Start: 9 @12795 has 9 MA's), (Start: 14 @12819 has 1 MA's), (54, 13068), (60, 13116), (61, 13125), (63, 13131), (67, 13170),

Gene: MortySmith\_19 Start: 10831, Stop: 11199, Start Num: 13

Candidate Starts for MortySmith\_19:

(7, 10795), (Start: 13 @10831 has 26 MA's), (42, 10999), (65, 11179),

Gene: NarutoRun\_21 Start: 11650, Stop: 12018, Start Num: 13

Candidate Starts for NarutoRun\_21:

(7, 11614), (Start: 13 @11650 has 26 MA's), (42, 11818), (65, 11998),

Gene: Neptune\_21 Start: 11627, Stop: 11995, Start Num: 13

Candidate Starts for Neptune\_21:

(7, 11591), (Start: 13 @11627 has 26 MA's), (42, 11795), (65, 11975),

Gene: NorManre\_20 Start: 13650, Stop: 14027, Start Num: 11

Candidate Starts for NorManre\_20:

(Start: 11 @13650 has 30 MA's), (Start: 14 @13665 has 1 MA's), (26, 13740), (29, 13749), (46, 13854), (49, 13872), (51, 13878), (55, 13902), (56, 13923), (59, 13944), (68, 14007),

Gene: Nova\_19 Start: 13216, Stop: 13623, Start Num: 8

Candidate Starts for Nova\_19:

(Start: 8 @13216 has 20 MA's), (Start: 9 @13222 has 9 MA's), (Start: 14 @13246 has 1 MA's), (54, 13495), (60, 13543), (61, 13552), (63, 13558), (67, 13597),

Gene: NovaSharks\_18 Start: 11658, Stop: 12035, Start Num: 11

Candidate Starts for NovaSharks\_18:

(Start: 11 @11658 has 30 MA's), (Start: 14 @11673 has 1 MA's), (26, 11748), (29, 11757), (46, 11862), (49, 11880), (55, 11910), (59, 11952),

Gene: Oaker\_18 Start: 12884, Stop: 13267, Start Num: 9

Candidate Starts for Oaker\_18:

(Start: 9 @12884 has 9 MA's), (17, 12923), (32, 13013), (36, 13031), (59, 13184),

Gene: OtterstedtS21\_19 Start: 13740, Stop: 14117, Start Num: 11

Candidate Starts for OtterstedtS21\_19:

(Start: 11 @13740 has 30 MA's), (Start: 14 @13755 has 1 MA's), (26, 13830), (29, 13839), (40, 13899), (46, 13944), (49, 13962), (55, 13992), (59, 14034),

Gene: OverHedge\_21 Start: 11624, Stop: 11992, Start Num: 13

Candidate Starts for OverHedge\_21:

(7, 11588), (Start: 13 @11624 has 26 MA's), (42, 11792), (65, 11972),

Gene: PBI1\_20 Start: 12720, Stop: 13127, Start Num: 8

Candidate Starts for PBI1\_20:

(Start: 8 @12720 has 20 MA's), (Start: 9 @12726 has 9 MA's), (Start: 14 @12750 has 1 MA's), (54, 12999), (60, 13047), (61, 13056), (63, 13062), (67, 13101),

Gene: PLOT\_20 Start: 12792, Stop: 13199, Start Num: 8

Candidate Starts for PLOT\_20:

(Start: 8 @12792 has 20 MA's), (Start: 9 @12798 has 9 MA's), (Start: 14 @12822 has 1 MA's), (54, 13071), (60, 13119), (61, 13128), (63, 13134), (67, 13173),

Gene: ParvusTarda\_19 Start: 13222, Stop: 13599, Start Num: 11

Candidate Starts for ParvusTarda\_19:

(Start: 11 @13222 has 30 MA's), (Start: 14 @13237 has 1 MA's), (26, 13312), (29, 13321), (46, 13426), (49, 13444), (51, 13450), (55, 13474), (56, 13495), (59, 13516),

Gene: Patience\_26 Start: 16390, Stop: 16761, Start Num: 11

Candidate Starts for Patience\_26:

(Start: 11 @16390 has 30 MA's), (15, 16414), (22, 16465), (30, 16504), (33, 16519),

Gene: Patos\_20 Start: 13650, Stop: 14027, Start Num: 11

Candidate Starts for Patos\_20:

(Start: 11 @13650 has 30 MA's), (Start: 14 @13665 has 1 MA's), (26, 13740), (29, 13749), (46, 13854), (49, 13872), (51, 13878), (55, 13902), (56, 13923), (59, 13944), (68, 14007),

Gene: Penelope2018\_19 Start: 12789, Stop: 13196, Start Num: 8

Candidate Starts for Penelope2018\_19:

(Start: 8 @12789 has 20 MA's), (Start: 9 @12795 has 9 MA's), (Start: 14 @12819 has 1 MA's), (54, 13068), (60, 13116), (61, 13125), (63, 13131), (67, 13170),

Gene: Pharpay\_21 Start: 11672, Stop: 12040, Start Num: 13

Candidate Starts for Pharpay\_21:

(7, 11636), (Start: 13 @11672 has 26 MA's), (42, 11840), (65, 12020),

Gene: Phreeze\_18 Start: 12625, Stop: 13008, Start Num: 9

Candidate Starts for Phreeze\_18:

(Start: 9 @12625 has 9 MA's), (17, 12664), (32, 12754), (36, 12772), (59, 12925),

Gene: PhunaPhoke\_21 Start: 11645, Stop: 12013, Start Num: 13

Candidate Starts for PhunaPhoke\_21:

(7, 11609), (Start: 13 @11645 has 26 MA's), (42, 11813), (65, 11993),

Gene: Potty\_21 Start: 11650, Stop: 12018, Start Num: 13

Candidate Starts for Potty\_21:

(7, 11614), (Start: 13 @11650 has 26 MA's), (42, 11818), (65, 11998),

Gene: Poultruss\_20 Start: 11423, Stop: 11791, Start Num: 13

Candidate Starts for Poultruss\_20:

(7, 11387), (Start: 13 @11423 has 26 MA's), (42, 11591), (65, 11771),

Gene: Prager\_19 Start: 12831, Stop: 13208, Start Num: 14

Candidate Starts for Prager\_19:

(5, 12708), (Start: 8 @12801 has 20 MA's), (Start: 9 @12807 has 9 MA's), (Start: 14 @12831 has 1 MA's), (54, 13080), (60, 13128), (61, 13137), (63, 13143), (67, 13182),

Gene: Predator\_22 Start: 14150, Stop: 14533, Start Num: 9

Candidate Starts for Predator\_22:

(Start: 9 @14150 has 9 MA's), (17, 14189), (31, 14276), (40, 14315), (51, 14384), (59, 14450),

Gene: Puissant\_17 Start: 13081, Stop: 13464, Start Num: 9  
Candidate Starts for Puissant\_17:  
(Start: 9 @13081 has 9 MA's), (17, 13120), (34, 13219), (40, 13246), (59, 13381),

Gene: Rachella\_21 Start: 11653, Stop: 12021, Start Num: 13  
Candidate Starts for Rachella\_21:  
(7, 11617), (Start: 13 @11653 has 26 MA's), (42, 11821), (65, 12001),

Gene: Ranch\_19 Start: 12588, Stop: 12965, Start Num: 11  
Candidate Starts for Ranch\_19:  
(Start: 11 @12588 has 30 MA's), (Start: 14 @12603 has 1 MA's), (26, 12678), (29, 12687), (46, 12792), (49, 12810), (51, 12816), (53, 12825), (55, 12840), (59, 12882),

Gene: Rie18\_21 Start: 11004, Stop: 11372, Start Num: 13  
Candidate Starts for Rie18\_21:  
(7, 10968), (Start: 13 @11004 has 26 MA's), (42, 11172), (65, 11352),

Gene: RikSengupta\_22 Start: 11688, Stop: 12074, Start Num: 12  
Candidate Starts for RikSengupta\_22:  
(6, 11598), (Start: 12 @11688 has 6 MA's), (15, 11709), (38, 11838), (43, 11880), (47, 11913), (57, 11976), (60, 12012), (62, 12024),

Gene: Rumi\_18 Start: 11658, Stop: 12035, Start Num: 11  
Candidate Starts for Rumi\_18:  
(Start: 11 @11658 has 30 MA's), (Start: 14 @11673 has 1 MA's), (26, 11748), (29, 11757), (46, 11862), (49, 11880), (55, 11910), (59, 11952),

Gene: Sadboi\_19 Start: 14418, Stop: 14795, Start Num: 11  
Candidate Starts for Sadboi\_19:  
(Start: 11 @14418 has 30 MA's), (Start: 14 @14433 has 1 MA's), (26, 14508), (29, 14517), (40, 14577), (46, 14622), (49, 14640), (55, 14670), (59, 14712),

Gene: Sampudon\_19 Start: 14594, Stop: 14971, Start Num: 11  
Candidate Starts for Sampudon\_19:  
(Start: 11 @14594 has 30 MA's), (Start: 14 @14609 has 1 MA's), (26, 14684), (29, 14693), (40, 14753), (46, 14798), (49, 14816), (55, 14846), (59, 14888),

Gene: Sienna\_14 Start: 9137, Stop: 9526, Start Num: 10  
Candidate Starts for Sienna\_14:  
(Start: 10 @9137 has 9 MA's), (19, 9182), (50, 9374), (61, 9455), (64, 9479),

Gene: SirHarley\_18 Start: 12751, Stop: 13128, Start Num: 14  
Candidate Starts for SirHarley\_18:  
(Start: 8 @12721 has 20 MA's), (Start: 9 @12727 has 9 MA's), (Start: 14 @12751 has 1 MA's), (54, 13000), (60, 13048), (61, 13057), (63, 13063), (67, 13102),

Gene: Snakehole\_22 Start: 10949, Stop: 11317, Start Num: 13  
Candidate Starts for Snakehole\_22:  
(7, 10913), (Start: 13 @10949 has 26 MA's), (42, 11117), (65, 11297),

Gene: Sparcetus\_22 Start: 11567, Stop: 11953, Start Num: 12  
Candidate Starts for Sparcetus\_22:

(6, 11477), (Start: 12 @11567 has 6 MA's), (15, 11588), (38, 11717), (43, 11759), (47, 11792), (57, 11855), (60, 11891), (62, 11903),

Gene: Suzy\_15 Start: 10365, Stop: 10754, Start Num: 10

Candidate Starts for Suzy\_15:

(Start: 10 @10365 has 9 MA's), (Start: 14 @10383 has 1 MA's), (19, 10410), (50, 10602), (52, 10608), (61, 10683), (64, 10707),

Gene: Tedro\_21 Start: 11123, Stop: 11491, Start Num: 13

Candidate Starts for Tedro\_21:

(7, 11087), (Start: 13 @11123 has 26 MA's), (42, 11291), (65, 11471),

Gene: Terapin\_14 Start: 9137, Stop: 9526, Start Num: 10

Candidate Starts for Terapin\_14:

(Start: 10 @9137 has 9 MA's), (19, 9182), (50, 9374), (61, 9455), (64, 9479),

Gene: Thoth\_19 Start: 12786, Stop: 13193, Start Num: 8

Candidate Starts for Thoth\_19:

(Start: 8 @12786 has 20 MA's), (Start: 9 @12792 has 9 MA's), (Start: 14 @12816 has 1 MA's), (54, 13065), (60, 13113), (61, 13122), (63, 13128), (67, 13167),

Gene: Thumb\_18 Start: 12626, Stop: 13009, Start Num: 9

Candidate Starts for Thumb\_18:

(Start: 9 @12626 has 9 MA's), (32, 12755), (36, 12773), (59, 12926),

Gene: Tillicus\_19 Start: 12967, Stop: 13344, Start Num: 11

Candidate Starts for Tillicus\_19:

(Start: 11 @12967 has 30 MA's), (Start: 14 @12982 has 1 MA's), (26, 13057), (32, 13090), (49, 13189), (55, 13219),

Gene: TinyMiny\_22 Start: 11586, Stop: 11972, Start Num: 12

Candidate Starts for TinyMiny\_22:

(6, 11496), (Start: 12 @11586 has 6 MA's), (15, 11607), (38, 11736), (43, 11778), (47, 11811), (57, 11874), (60, 11910), (62, 11922),

Gene: Triscuit\_41 Start: 21862, Stop: 22263, Start Num: 11

Candidate Starts for Triscuit\_41:

(4, 21730), (Start: 11 @21862 has 30 MA's), (15, 21886), (18, 21901), (20, 21928), (23, 21940), (25, 21961), (39, 22030), (66, 22234),

Gene: Troll4\_19 Start: 12790, Stop: 13197, Start Num: 8

Candidate Starts for Troll4\_19:

(Start: 8 @12790 has 20 MA's), (Start: 9 @12796 has 9 MA's), (Start: 14 @12820 has 1 MA's), (54, 13069), (60, 13117), (61, 13126), (63, 13132), (67, 13171),

Gene: Visconti\_19 Start: 12799, Stop: 13206, Start Num: 8

Candidate Starts for Visconti\_19:

(Start: 8 @12799 has 20 MA's), (Start: 9 @12805 has 9 MA's), (Start: 14 @12829 has 1 MA's), (54, 13078), (60, 13126), (61, 13135), (63, 13141), (67, 13180),

Gene: WaldoWhy\_20 Start: 12795, Stop: 13202, Start Num: 8

Candidate Starts for WaldoWhy\_20:

(5, 12702), (Start: 8 @12795 has 20 MA's), (Start: 9 @12801 has 9 MA's), (Start: 14 @12825 has 1 MA's), (54, 13074), (60, 13122), (61, 13131), (63, 13137), (67, 13176),

Gene: Wojtek\_18 Start: 13295, Stop: 13672, Start Num: 11

Candidate Starts for Wojtek\_18:

(Start: 11 @13295 has 30 MA's), (Start: 14 @13310 has 1 MA's), (26, 13385), (29, 13394), (40, 13454), (46, 13499), (49, 13517), (55, 13547), (59, 13589),

Gene: Wollypog\_9 Start: 8239, Stop: 8610, Start Num: 11

Candidate Starts for Wollypog\_9:

(Start: 11 @8239 has 30 MA's), (15, 8263), (16, 8269), (35, 8398), (41, 8425), (43, 8440), (47, 8470), (48, 8473), (52, 8479), (60, 8545), (67, 8596),

Gene: Xenia2\_16 Start: 13334, Stop: 13714, Start Num: 11

Candidate Starts for Xenia2\_16:

(Start: 11 @13334 has 30 MA's), (Start: 14 @13349 has 1 MA's), (26, 13424), (34, 13466), (44, 13526), (49, 13559),

Gene: Yikes\_20 Start: 14679, Stop: 15056, Start Num: 11

Candidate Starts for Yikes\_20:

(Start: 11 @14679 has 30 MA's), (Start: 14 @14694 has 1 MA's), (26, 14769), (29, 14778), (46, 14883), (49, 14901), (51, 14907), (55, 14931), (56, 14952), (59, 14973),

Gene: Zany\_18 Start: 13808, Stop: 14185, Start Num: 11

Candidate Starts for Zany\_18:

(Start: 11 @13808 has 30 MA's), (Start: 14 @13823 has 1 MA's), (26, 13898), (29, 13907), (46, 14012), (49, 14030), (55, 14060), (59, 14102),