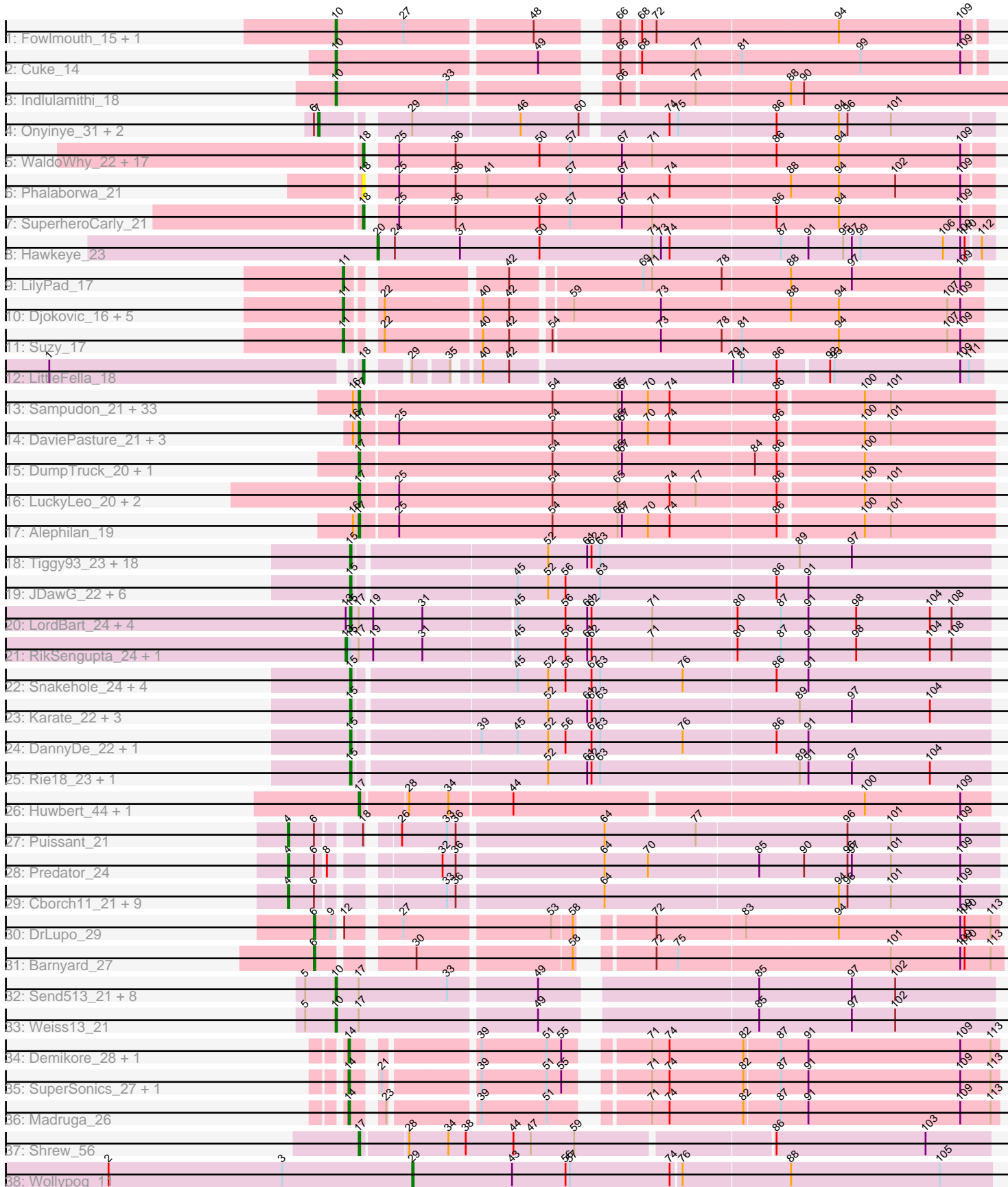


Pham 311306



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 311306 Report

This analysis was run 06/27/26 on database version 652.

Pham number 311306 has 160 members, 13 are drafts.

Phages represented in each track:

- Track 1 : Fowlmouth\_15, MrMiyagi\_15
- Track 2 : Cuke\_14
- Track 3 : Indlulamithi\_18
- Track 4 : Onyinye\_31, Leopard\_30, Aikoy\_30
- Track 5 : WaldoWhy\_22, Nova\_21, Butterscotch\_21, SirHarley\_20, Penelope2018\_21, Thoth\_21, Chill\_22, Giuseppe\_21, Mopey\_21, Prager\_21, PLOT\_22, Troll4\_21, Adjutor\_22, Visconti\_21, Gumball\_20, Helpful\_22, Delton\_21, PBI1\_22
- Track 6 : Phalaborwa\_21
- Track 7 : SuperheroCarly\_21
- Track 8 : Hawkeye\_23
- Track 9 : LilyPad\_17
- Track 10 : Djokovic\_16, Madi\_16, Terapin\_16, BiteSize\_16, Sienna\_16, Beyoncage\_16
- Track 11 : Suzy\_17
- Track 12 : LittleFella\_18
- Track 13 : Sampudon\_21, Charminar\_19, Yikes\_22, Gibbin\_22, Stormer\_19, ParvusTarda\_21, Lambo\_21, OtterstedtS21\_21, Fulcrum\_22, Alyssmiracle\_20, Lila22\_21, Genamy16\_20, Riduram\_19, MoiGyank\_23, Avian\_19, GretelLyn\_21, Rumi\_20, BirthdayBoy\_22, Patos\_22, Sadboi\_21, Astralis\_19, GOATification\_22, Erutan\_21, Ranch\_21, Rukungu\_21, Jamemuya19\_19, Wojtek\_20, Pywacket\_20, RazorC\_19, NovaSharks\_20, NorManre\_22, Jalebi\_21, Rota\_20, DoobyDoo\_20
- Track 14 : DaviePasture\_21, Mima20\_20, LavAbarElk\_19, Zany\_20
- Track 15 : DumpTruck\_20, Xenia2\_21
- Track 16 : LuckyLeo\_20, Apeppi\_19, Tillicus\_21
- Track 17 : Alephilan\_19
- Track 18 : Tiggy93\_23, Krampus\_23, Neptune\_23, Pharpay\_23, Gilda\_23, Anakin\_23, Rachella\_23, Poultruss\_22, Kate\_23, AnnaSerena\_23, CoolCookie\_23, OhDear\_23, Potty\_23, PhunaPhoke\_23, Artiphact\_23, Tedro\_23, Cybele\_23, OverHedge\_23, NarutoRun\_23
- Track 19 : JDawG\_22, Dauntless\_22, Crestdrop\_22, Aesir\_22, Annapurna\_22, Erudite\_22, MortySmith\_21
- Track 20 : LordBart\_24, Ajin\_24, TinyMiny\_24, Kors\_24, Bramble\_24
- Track 21 : RikSengupta\_24, Sparcetus\_24
- Track 22 : Snakehole\_24, FreddieHg\_22, JingleBells\_22, Hiddenleaf\_22, Chivey\_22
- Track 23 : Karate\_22, Haunter\_23, FountainFog\_22, Tongui\_22
- Track 24 : DannyDe\_22, SilentWarrior\_22

- Track 25 : Rie18\_23, Hager\_24
- Track 26 : Huwbert\_44, Triscuit\_43
- Track 27 : Puissant\_21
- Track 28 : Predator\_24
- Track 29 : Cborch11\_21, BobtimousPrime\_22, Phreeze\_20, Damien\_20, Beckerton\_20, Oaker\_20, Nish23\_21, Megatron06\_22, Konstantine\_25, Thumb\_20
- Track 30 : DrLupo\_29
- Track 31 : Barnyard\_27
- Track 32 : Send513\_21, MontyDev\_21, Candle\_21, Nilo\_22, Papyrus\_21, Riparian\_21, Zenon\_22, Rope\_21, Yelo\_21
- Track 33 : Weiss13\_21
- Track 34 : Demikore\_28, Patience\_28
- Track 35 : SuperSonics\_27, Labelle\_27
- Track 36 : Madruga\_26
- Track 37 : Shrew\_56
- Track 38 : Wollypog\_11

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

The start number called the most often in the published annotations is 17, it was called in 42 of the 147 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Alephlan\_19, Alyssamiracle\_20, Apeppi\_19, Astralis\_19, Avian\_19, BirthdayBoy\_22, Charminar\_19, DaviePasture\_21, DoobyDoo\_20, DumpTruck\_20, Erutan\_21, Fulcrum\_22, GOATification\_22, Genamy16\_20, Gibbin\_22, GretellLyn\_21, Huwbert\_44, Jalebi\_21, Jamemuya19\_19, Lambo\_21, LavAbarElk\_19, Lila22\_21, LuckyLeo\_20, Mima20\_20, MoiGyank\_23, NorManre\_22, NovaSharks\_20, OtterstedtS21\_21, ParvusTarda\_21, Patos\_22, Pywacket\_20, Ranch\_21, RazorC\_19, Riduram\_19, Rota\_20, Rukungu\_21, Rumi\_20, Sadboi\_21, Sampudon\_21, Shrew\_56, Stormer\_19, Tillicus\_21, Triscuit\_43, Wojtek\_20, Xenia2\_21, Yikes\_22, Zany\_20,

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

- Ajin\_24, Bramble\_24, Candle\_21, Kors\_24, LordBart\_24, MontyDev\_21, Nilo\_22, Papyrus\_21, RikSengupta\_24, Riparian\_21, Rope\_21, Send513\_21, Sparcetus\_24, TinyMiny\_24, Weiss13\_21, Yelo\_21, Zenon\_22,

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

- Adjutor\_22, Aesir\_22, Aikoy\_30, Anakin\_23, AnnaSerena\_23, Annapurna\_22, Artiphact\_23, Barnyard\_27, Beckerton\_20, Beyoncage\_16, BiteSize\_16, BobtimousPrime\_22, Butterscotch\_21, Cborch11\_21, Chill\_22, Chivey\_22, CoolCookie\_23, Crestdrop\_22, Cuke\_14, Cybele\_23, Damien\_20, DannyDe\_22, Dauntless\_22, Delton\_21, Demikore\_28, Djokovic\_16, DrLupo\_29, Erudite\_22, FountainFog\_22, Fowlmouth\_15, FreddieHg\_22, Gilda\_23, Giuseppe\_21, Gumball\_20, Hager\_24, Haunter\_23, Hawkeye\_23, Helpful\_22, Hiddenleaf\_22, Indlulamithi\_18, JDawG\_22, JingleBells\_22, Karate\_22, Kate\_23, Konstantine\_25, Krampus\_23, Labelle\_27, Leopard\_30, LilyPad\_17, LittleFella\_18, Madi\_16, Madruga\_26, Megatron06\_22, Mopey\_21, MortySmith\_21, MrMiyagi\_15, NarutoRun\_23, Neptune\_23, Nish23\_21, Nova\_21, Oaker\_20, OhDear\_23,

Onyinye\_31, OverHedge\_23, PBI1\_22, PLOT\_22, Patience\_28, Penelope2018\_21, Phalaborwa\_21, Pharpay\_23, Phreeze\_20, PhunaPhoke\_23, Potty\_23, Poultruss\_22, Prager\_21, Predator\_24, Puissant\_21, Rachella\_23, Rie18\_23, Sienna\_16, SilentWarrior\_22, SirHarley\_20, Snakehole\_24, SuperSonics\_27, SuperheroCarly\_21, Suzy\_17, Tedro\_23, Terapin\_16, Thoth\_21, Thumb\_20, Tiggy93\_23, Tongui\_22, Troll4\_21, Visconti\_21, WaldoWhy\_22, Wollypog\_11,

### Summary by start number:

#### Start 4:

- Found in 12 of 160 ( 7.5% ) of genes in pham
- Manual Annotations of this start: 11 of 147
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Beckerton\_20 (H1), BobtimousPrime\_22 (H1), Cborch11\_21 (H1), Damien\_20 (H1), Konstantine\_25 (H1), Megatron06\_22 (H1), Nish23\_21 (H1), Oaker\_20 (H1), Phreeze\_20 (H1), Predator\_24 (H1), Puissant\_21 (H1), Thumb\_20 (H1),

#### Start 6:

- Found in 17 of 160 ( 10.6% ) of genes in pham
- Manual Annotations of this start: 2 of 147
- Called 11.8% of time when present
- Phage (with cluster) where this start called: Barnyard\_27 (H2), DrLupo\_29 (H2),

#### Start 7:

- Found in 3 of 160 ( 1.9% ) of genes in pham
- Manual Annotations of this start: 3 of 147
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aikoy\_30 (AE), Leopard\_30 (AE), Onyinye\_31 (AE),

#### Start 10:

- Found in 14 of 160 ( 8.8% ) of genes in pham
- Manual Annotations of this start: 14 of 147
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Candle\_21 (R), Cuke\_14 (AC), Fowlmouth\_15 (AC), Indlulamithi\_18 (AC), MontyDev\_21 (R), MrMiyagi\_15 (AC), Nilo\_22 (R), Papyrus\_21 (R), Riparian\_21 (R), Rope\_21 (R), Send513\_21 (R), Weiss13\_21 (R), Yelo\_21 (R), Zenon\_22 (R),

#### Start 11:

- Found in 8 of 160 ( 5.0% ) of genes in pham
- Manual Annotations of this start: 8 of 147
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Beyoncage\_16 (DG1), BiteSize\_16 (DG1), Djokovic\_16 (DG1), LilyPad\_17 (DG1), Madi\_16 (DG1), Sienna\_16 (DG1), Suzy\_17 (DG1), Terapin\_16 (DG1),

#### Start 13:

- Found in 7 of 160 ( 4.4% ) of genes in pham
- Manual Annotations of this start: 2 of 147
- Called 28.6% of time when present

- Phage (with cluster) where this start called: RikSengupta\_24 (EF), Sparcetus\_24 (EF),

#### Start 14:

- Found in 5 of 160 ( 3.1% ) of genes in pham
- Manual Annotations of this start: 3 of 147
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Demikore\_28 (U), Labelle\_27 (U), Madrugua\_26 (U), Patience\_28 (U), SuperSonics\_27 (U),

#### Start 15:

- Found in 46 of 160 ( 28.7% ) of genes in pham
- Manual Annotations of this start: 40 of 147
- Called 95.7% of time when present
- Phage (with cluster) where this start called: Aesir\_22 (EF), Ajin\_24 (EF), Anakin\_23 (EF), AnnaSerena\_23 (EF), Annapurna\_22 (EF), Artiphact\_23 (EF), Bramble\_24 (EF), Chivey\_22 (EF), CoolCookie\_23 (EF), Crestdrop\_22 (EF), Cybele\_23 (EF), DannyDe\_22 (EF), Dauntless\_22 (EF), Erudite\_22 (EF), FountainFog\_22 (EF), FreddieHg\_22 (EF), Gilda\_23 (EF), Hager\_24 (EF), Haunter\_23 (EF), Hiddenleaf\_22 (EF), JDawG\_22 (EF), JingleBells\_22 (EF), Karate\_22 (EF), Kate\_23 (EF), Kors\_24 (EF), Krampus\_23 (EF), LordBart\_24 (EF), MortySmith\_21 (EF), NarutoRun\_23 (EF), Neptune\_23 (EF), OhDear\_23 (EF), OverHedge\_23 (EF), Pharpay\_23 (EF), PhunaPhoke\_23 (EF), Potty\_23 (EF), Poultruss\_22 (EF), Rachella\_23 (EF), Rie18\_23 (EF), SilentWarrior\_22 (EF), Snakehole\_24 (EF), Tedro\_23 (EF), Tiggy93\_23 (EF), TinyMiny\_24 (EF), Tongui\_22 (EF),

#### Start 17:

- Found in 64 of 160 ( 40.0% ) of genes in pham
- Manual Annotations of this start: 42 of 147
- Called 73.4% of time when present
- Phage (with cluster) where this start called: Alephilan\_19 (DV), Alyssamiracle\_20 (DV), Apeppi\_19 (DV), Astralis\_19 (DV), Avian\_19 (DV), BirthdayBoy\_22 (DV), Charminar\_19 (DV), DaviePasture\_21 (DV), DoobyDoo\_20 (DV), DumpTruck\_20 (DV), Erutan\_21 (DV), Fulcrum\_22 (DV), GOATification\_22 (DV), Genamy16\_20 (DV), Gibbin\_22 (DV), GretelLyn\_21 (DV), Huwburt\_44 (GG), Jalebi\_21 (DV), Jamemuya19\_19 (DV), Lambo\_21 (DV), LavAbarElk\_19 (DV), Lila22\_21 (DV), LuckyLeo\_20 (DV), Mima20\_20 (DV), MoiGyank\_23 (DV), NorManre\_22 (DV), NovaSharks\_20 (DV), OtterstedtS21\_21 (DV), ParvusTarda\_21 (DV), Patos\_22 (DV), Pywacket\_20 (DV), Ranch\_21 (DV), RazorC\_19 (DV), Riduram\_19 (DV), Rota\_20 (DV), Rukungu\_21 (DV), Rumi\_20 (DV), Sadboi\_21 (DV), Sampudon\_21 (DV), Shrew\_56 (singleton), Stormer\_19 (DV), Tillicus\_21 (DV), Triscuit\_43 (GG), Wojtek\_20 (DV), Xenia2\_21 (DV), Yikes\_22 (DV), Zany\_20 (DV),

#### Start 18:

- Found in 22 of 160 ( 13.8% ) of genes in pham
- Manual Annotations of this start: 20 of 147
- Called 95.5% of time when present
- Phage (with cluster) where this start called: Adjutor\_22 (D1), Butterscotch\_21 (D1), Chill\_22 (D1), Delton\_21 (D1), Giuseppe\_21 (D1), Gumball\_20 (D1), Helpful\_22 (D1), LittleFella\_18 (DG2), Mopey\_21 (D1), Nova\_21 (D1), PBI1\_22 (D1), PLOT\_22 (D1), Penelope2018\_21 (D1), Phalaborwa\_21 (D1), Prager\_21 (D1), SirHarley\_20 (D1), SuperheroCarly\_21 (D1), Thoth\_21 (D1), Troll4\_21 (D1), Visconti\_21 (D1), WaldoWhy\_22 (D1),

Start 20:

- Found in 1 of 160 ( 0.6% ) of genes in pham
- Manual Annotations of this start: 1 of 147
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Hawkeye\_23 (D2),

Start 29:

- Found in 5 of 160 ( 3.1% ) of genes in pham
- Manual Annotations of this start: 1 of 147
- Called 20.0% of time when present
- Phage (with cluster) where this start called: Wollypog\_11 (singleton),

**Summary by clusters:**

There are 14 clusters represented in this pham: DG2, singleton, EF, AE, H2, H1, AC, GG, DG1, U, DV, R, D2, D1,

Info for manual annotations of cluster AC:

- Start number 10 was manually annotated 4 times for cluster AC.

Info for manual annotations of cluster AE:

- Start number 7 was manually annotated 3 times for cluster AE.

Info for manual annotations of cluster D1:

- Start number 18 was manually annotated 19 times for cluster D1.

Info for manual annotations of cluster D2:

- Start number 20 was manually annotated 1 time for cluster D2.

Info for manual annotations of cluster DG1:

- Start number 11 was manually annotated 8 times for cluster DG1.

Info for manual annotations of cluster DG2:

- Start number 18 was manually annotated 1 time for cluster DG2.

Info for manual annotations of cluster DV:

- Start number 17 was manually annotated 39 times for cluster DV.

Info for manual annotations of cluster EF:

- Start number 13 was manually annotated 2 times for cluster EF.
- Start number 15 was manually annotated 40 times for cluster EF.

Info for manual annotations of cluster GG:

- Start number 17 was manually annotated 2 times for cluster GG.

Info for manual annotations of cluster H1:

- Start number 4 was manually annotated 11 times for cluster H1.

Info for manual annotations of cluster H2:

- Start number 6 was manually annotated 2 times for cluster H2.

Info for manual annotations of cluster R:

- Start number 10 was manually annotated 10 times for cluster R.

Info for manual annotations of cluster U:

- Start number 14 was manually annotated 3 times for cluster U.

### **Gene Information:**

Gene: Adjutor\_22 Start: 13488, Stop: 13907, Start Num: 18

Candidate Starts for Adjutor\_22:

(Start: 18 @13488 has 20 MA's), (25, 13503), (36, 13542), (50, 13599), (57, 13620), (67, 13656), (71, 13677), (86, 13761), (94, 13803), (109, 13887),

Gene: Aesir\_22 Start: 12181, Stop: 12609, Start Num: 15

Candidate Starts for Aesir\_22:

(Start: 15 @12181 has 40 MA's), (45, 12286), (52, 12307), (56, 12319), (63, 12343), (86, 12463), (91, 12484),

Gene: Aikoy\_30 Start: 19005, Stop: 19439, Start Num: 7

Candidate Starts for Aikoy\_30:

(Start: 6 @19002 has 2 MA's), (Start: 7 @19005 has 3 MA's), (Start: 29 @19056 has 1 MA's), (46, 19128), (60, 19167), (74, 19221), (75, 19227), (86, 19293), (94, 19335), (96, 19341), (101, 19371),

Gene: Ajin\_24 Start: 12379, Stop: 12810, Start Num: 15

Candidate Starts for Ajin\_24:

(Start: 13 @12376 has 2 MA's), (Start: 15 @12379 has 40 MA's), (Start: 17 @12385 has 42 MA's), (19, 12394), (31, 12427), (45, 12487), (56, 12520), (61, 12535), (62, 12538), (71, 12580), (80, 12637), (87, 12667), (91, 12685), (98, 12718), (104, 12769), (108, 12784),

Gene: Alephilan\_19 Start: 13971, Stop: 14399, Start Num: 17

Candidate Starts for Alephilan\_19:

(16, 13968), (Start: 17 @13971 has 42 MA's), (25, 13995), (54, 14100), (65, 14145), (67, 14148), (70, 14166), (74, 14181), (86, 14253), (100, 14310), (101, 14328),

Gene: Alyssamiracle\_20 Start: 12378, Stop: 12806, Start Num: 17

Candidate Starts for Alyssamiracle\_20:

(16, 12375), (Start: 17 @12378 has 42 MA's), (54, 12507), (65, 12552), (67, 12555), (70, 12573), (74, 12588), (86, 12660), (100, 12717), (101, 12735),

Gene: Anakin\_23 Start: 12391, Stop: 12819, Start Num: 15

Candidate Starts for Anakin\_23:

(Start: 15 @12391 has 40 MA's), (52, 12517), (61, 12544), (62, 12547), (63, 12553), (89, 12688), (97, 12724),

Gene: AnnaSerena\_23 Start: 12400, Stop: 12828, Start Num: 15

Candidate Starts for AnnaSerena\_23:

(Start: 15 @12400 has 40 MA's), (52, 12526), (61, 12553), (62, 12556), (63, 12562), (89, 12697), (97, 12733),

Gene: Annapurna\_22 Start: 11600, Stop: 12028, Start Num: 15

Candidate Starts for Annapurna\_22:

(Start: 15 @11600 has 40 MA's), (45, 11705), (52, 11726), (56, 11738), (63, 11762), (86, 11882), (91, 11903),

Gene: Apeppi\_19 Start: 14093, Stop: 14521, Start Num: 17

Candidate Starts for Apeppi\_19:

(Start: 17 @14093 has 42 MA's), (25, 14117), (54, 14222), (65, 14267), (74, 14303), (77, 14321), (86, 14375), (100, 14432), (101, 14450),

Gene: Artiphact\_23 Start: 12392, Stop: 12820, Start Num: 15

Candidate Starts for Artiphact\_23:

(Start: 15 @12392 has 40 MA's), (52, 12518), (61, 12545), (62, 12548), (63, 12554), (89, 12689), (97, 12725),

Gene: Astralis\_19 Start: 12378, Stop: 12806, Start Num: 17

Candidate Starts for Astralis\_19:

(16, 12375), (Start: 17 @12378 has 42 MA's), (54, 12507), (65, 12552), (67, 12555), (70, 12573), (74, 12588), (86, 12660), (100, 12717), (101, 12735),

Gene: Avian\_19 Start: 12378, Stop: 12806, Start Num: 17

Candidate Starts for Avian\_19:

(16, 12375), (Start: 17 @12378 has 42 MA's), (54, 12507), (65, 12552), (67, 12555), (70, 12573), (74, 12588), (86, 12660), (100, 12717), (101, 12735),

Gene: Barnyard\_27 Start: 15178, Stop: 15603, Start Num: 6

Candidate Starts for Barnyard\_27:

(Start: 6 @15178 has 2 MA's), (30, 15232), (58, 15331), (72, 15367), (75, 15382), (101, 15526), (109, 15574), (110, 15577), (113, 15595),

Gene: Beckerton\_20 Start: 13898, Stop: 14365, Start Num: 4

Candidate Starts for Beckerton\_20:

(Start: 4 @13898 has 11 MA's), (Start: 6 @13916 has 2 MA's), (33, 13985), (36, 13991), (64, 14087), (94, 14246), (96, 14252), (101, 14282), (109, 14330),

Gene: Beyoncage\_16 Start: 9866, Stop: 10276, Start Num: 11

Candidate Starts for Beyoncage\_16:

(Start: 11 @9866 has 8 MA's), (22, 9881), (40, 9944), (42, 9962), (59, 9998), (73, 10058), (88, 10145), (94, 10178), (107, 10253), (109, 10262),

Gene: BirthdayBoy\_22 Start: 14824, Stop: 15252, Start Num: 17

Candidate Starts for BirthdayBoy\_22:

(16, 14821), (Start: 17 @14824 has 42 MA's), (54, 14953), (65, 14998), (67, 15001), (70, 15019), (74, 15034), (86, 15106), (100, 15163), (101, 15181),

Gene: BiteSize\_16 Start: 9866, Stop: 10276, Start Num: 11

Candidate Starts for BiteSize\_16:

(Start: 11 @9866 has 8 MA's), (22, 9881), (40, 9944), (42, 9962), (59, 9998), (73, 10058), (88, 10145), (94, 10178), (107, 10253), (109, 10262),

Gene: BobtimousPrime\_22 Start: 13818, Stop: 14276, Start Num: 4

Candidate Starts for BobtimousPrime\_22:

(Start: 4 @13818 has 11 MA's), (Start: 6 @13836 has 2 MA's), (33, 13905), (36, 13911), (64, 14007), (94, 14166), (96, 14172), (101, 14202), (109, 14250),

Gene: Bramble\_24 Start: 12344, Stop: 12775, Start Num: 15

Candidate Starts for Bramble\_24:

(Start: 13 @12341 has 2 MA's), (Start: 15 @12344 has 40 MA's), (Start: 17 @12350 has 42 MA's), (19, 12359), (31, 12392), (45, 12452), (56, 12485), (61, 12500), (62, 12503), (71, 12545), (80, 12602), (87, 12632), (91, 12650), (98, 12683), (104, 12734), (108, 12749),

Gene: Butterscotch\_21 Start: 13548, Stop: 13967, Start Num: 18

Candidate Starts for Butterscotch\_21:

(Start: 18 @13548 has 20 MA's), (25, 13563), (36, 13602), (50, 13659), (57, 13680), (67, 13716), (71, 13737), (86, 13821), (94, 13863), (109, 13947),

Gene: Candle\_21 Start: 13912, Stop: 14340, Start Num: 10

Candidate Starts for Candle\_21:

(5, 13891), (Start: 10 @13912 has 14 MA's), (Start: 17 @13927 has 42 MA's), (33, 13987), (49, 14044), (85, 14179), (97, 14242), (102, 14272),

Gene: Cborch11\_21 Start: 13361, Stop: 13819, Start Num: 4

Candidate Starts for Cborch11\_21:

(Start: 4 @13361 has 11 MA's), (Start: 6 @13379 has 2 MA's), (33, 13448), (36, 13454), (64, 13550), (94, 13709), (96, 13715), (101, 13745), (109, 13793),

Gene: Charminar\_19 Start: 12378, Stop: 12806, Start Num: 17

Candidate Starts for Charminar\_19:

(16, 12375), (Start: 17 @12378 has 42 MA's), (54, 12507), (65, 12552), (67, 12555), (70, 12573), (74, 12588), (86, 12660), (100, 12717), (101, 12735),

Gene: Chill\_22 Start: 13554, Stop: 13973, Start Num: 18

Candidate Starts for Chill\_22:

(Start: 18 @13554 has 20 MA's), (25, 13569), (36, 13608), (50, 13665), (57, 13686), (67, 13722), (71, 13743), (86, 13827), (94, 13869), (109, 13953),

Gene: Chivey\_22 Start: 11593, Stop: 12021, Start Num: 15

Candidate Starts for Chivey\_22:

(Start: 15 @11593 has 40 MA's), (45, 11698), (52, 11719), (56, 11731), (62, 11749), (63, 11755), (76, 11812), (86, 11875), (91, 11896),

Gene: CoolCookie\_23 Start: 12398, Stop: 12826, Start Num: 15

Candidate Starts for CoolCookie\_23:

(Start: 15 @12398 has 40 MA's), (52, 12524), (61, 12551), (62, 12554), (63, 12560), (89, 12695), (97, 12731),

Gene: Crestdrop\_22 Start: 11467, Stop: 11895, Start Num: 15

Candidate Starts for Crestdrop\_22:

(Start: 15 @11467 has 40 MA's), (45, 11572), (52, 11593), (56, 11605), (63, 11629), (86, 11749), (91, 11770),

Gene: Cuke\_14 Start: 9111, Stop: 9524, Start Num: 10

Candidate Starts for Cuke\_14:

(Start: 10 @9111 has 14 MA's), (49, 9243), (66, 9282), (68, 9294), (77, 9330), (81, 9360), (99, 9441), (109, 9510),

Gene: Cybele\_23 Start: 12368, Stop: 12796, Start Num: 15

Candidate Starts for Cybele\_23:

(Start: 15 @12368 has 40 MA's), (52, 12494), (61, 12521), (62, 12524), (63, 12530), (89, 12665), (97, 12701),

Gene: Damien\_20 Start: 13360, Stop: 13827, Start Num: 4

Candidate Starts for Damien\_20:

(Start: 4 @13360 has 11 MA's), (Start: 6 @13378 has 2 MA's), (33, 13447), (36, 13453), (64, 13549), (94, 13708), (96, 13714), (101, 13744), (109, 13792),

Gene: DannyDe\_22 Start: 11585, Stop: 12013, Start Num: 15

Candidate Starts for DannyDe\_22:

(Start: 15 @11585 has 40 MA's), (39, 11666), (45, 11690), (52, 11711), (56, 11723), (62, 11741), (63, 11747), (76, 11804), (86, 11867), (91, 11888),

Gene: Dauntless\_22 Start: 12110, Stop: 12538, Start Num: 15

Candidate Starts for Dauntless\_22:

(Start: 15 @12110 has 40 MA's), (45, 12215), (52, 12236), (56, 12248), (63, 12272), (86, 12392), (91, 12413),

Gene: DaviePasture\_21 Start: 14581, Stop: 15009, Start Num: 17

Candidate Starts for DaviePasture\_21:

(16, 14578), (Start: 17 @14581 has 42 MA's), (25, 14605), (54, 14710), (65, 14755), (67, 14758), (70, 14776), (74, 14791), (86, 14863), (100, 14920), (101, 14938),

Gene: Delton\_21 Start: 13560, Stop: 13979, Start Num: 18

Candidate Starts for Delton\_21:

(Start: 18 @13560 has 20 MA's), (25, 13575), (36, 13614), (50, 13671), (57, 13692), (67, 13728), (71, 13749), (86, 13833), (94, 13875), (109, 13959),

Gene: Demikore\_28 Start: 16743, Stop: 17144, Start Num: 14

Candidate Starts for Demikore\_28:

(Start: 14 @16743 has 3 MA's), (39, 16812), (51, 16857), (55, 16866), (71, 16908), (74, 16920), (82, 16971), (87, 16995), (91, 17013), (109, 17118), (113, 17139),

Gene: Djokovic\_16 Start: 9866, Stop: 10276, Start Num: 11

Candidate Starts for Djokovic\_16:

(Start: 11 @9866 has 8 MA's), (22, 9881), (40, 9944), (42, 9962), (59, 9998), (73, 10058), (88, 10145), (94, 10178), (107, 10253), (109, 10262),

Gene: DoobyDoo\_20 Start: 13758, Stop: 14186, Start Num: 17

Candidate Starts for DoobyDoo\_20:

(16, 13755), (Start: 17 @13758 has 42 MA's), (54, 13887), (65, 13932), (67, 13935), (70, 13953), (74, 13968), (86, 14040), (100, 14097), (101, 14115),

Gene: DrLupo\_29 Start: 15577, Stop: 15999, Start Num: 6

Candidate Starts for DrLupo\_29:

(Start: 6 @15577 has 2 MA's), (9, 15589), (12, 15592), (27, 15622), (53, 15718), (58, 15730), (72, 15766), (83, 15826), (94, 15889), (109, 15973), (110, 15976), (113, 15994),

Gene: DumpTruck\_20 Start: 14012, Stop: 14440, Start Num: 17

Candidate Starts for DumpTruck\_20:

(Start: 17 @14012 has 42 MA's), (54, 14141), (65, 14186), (67, 14189), (84, 14279), (86, 14294), (100, 14351),

Gene: Erudite\_22 Start: 12110, Stop: 12538, Start Num: 15

Candidate Starts for Erudite\_22:

(Start: 15 @12110 has 40 MA's), (45, 12215), (52, 12236), (56, 12248), (63, 12272), (86, 12392), (91, 12413),

Gene: Erutan\_21 Start: 14271, Stop: 14699, Start Num: 17

Candidate Starts for Erutan\_21:

(16, 14268), (Start: 17 @14271 has 42 MA's), (54, 14400), (65, 14445), (67, 14448), (70, 14466), (74, 14481), (86, 14553), (100, 14610), (101, 14628),

Gene: FountainFog\_22 Start: 11719, Stop: 12147, Start Num: 15

Candidate Starts for FountainFog\_22:

(Start: 15 @11719 has 40 MA's), (52, 11845), (61, 11872), (62, 11875), (63, 11881), (89, 12016), (97, 12052), (104, 12106),

Gene: Fowlmouth\_15 Start: 9282, Stop: 9695, Start Num: 10

Candidate Starts for Fowlmouth\_15:

(Start: 10 @9282 has 14 MA's), (27, 9327), (48, 9411), (66, 9453), (68, 9465), (72, 9474), (94, 9597), (109, 9681),

Gene: FreddieHg\_22 Start: 11609, Stop: 12037, Start Num: 15

Candidate Starts for FreddieHg\_22:

(Start: 15 @11609 has 40 MA's), (45, 11714), (52, 11735), (56, 11747), (62, 11765), (63, 11771), (76, 11828), (86, 11891), (91, 11912),

Gene: Fulcrum\_22 Start: 14804, Stop: 15232, Start Num: 17

Candidate Starts for Fulcrum\_22:

(16, 14801), (Start: 17 @14804 has 42 MA's), (54, 14933), (65, 14978), (67, 14981), (70, 14999), (74, 15014), (86, 15086), (100, 15143), (101, 15161),

Gene: GOATification\_22 Start: 14804, Stop: 15232, Start Num: 17

Candidate Starts for GOATification\_22:

(16, 14801), (Start: 17 @14804 has 42 MA's), (54, 14933), (65, 14978), (67, 14981), (70, 14999), (74, 15014), (86, 15086), (100, 15143), (101, 15161),

Gene: Genamy16\_20 Start: 12378, Stop: 12806, Start Num: 17

Candidate Starts for Genamy16\_20:

(16, 12375), (Start: 17 @12378 has 42 MA's), (54, 12507), (65, 12552), (67, 12555), (70, 12573), (74, 12588), (86, 12660), (100, 12717), (101, 12735),

Gene: Gibbin\_22 Start: 14864, Stop: 15292, Start Num: 17

Candidate Starts for Gibbin\_22:

(16, 14861), (Start: 17 @14864 has 42 MA's), (54, 14993), (65, 15038), (67, 15041), (70, 15059), (74, 15074), (86, 15146), (100, 15203), (101, 15221),

Gene: Gilda\_23 Start: 12392, Stop: 12820, Start Num: 15

Candidate Starts for Gilda\_23:

(Start: 15 @12392 has 40 MA's), (52, 12518), (61, 12545), (62, 12548), (63, 12554), (89, 12689), (97, 12725),

Gene: Giuseppe\_21 Start: 13540, Stop: 13959, Start Num: 18

Candidate Starts for Giuseppe\_21:

(Start: 18 @13540 has 20 MA's), (25, 13555), (36, 13594), (50, 13651), (57, 13672), (67, 13708), (71, 13729), (86, 13813), (94, 13855), (109, 13939),

Gene: Gretellyn\_21 Start: 15138, Stop: 15566, Start Num: 17

Candidate Starts for Gretellyn\_21:

(16, 15135), (Start: 17 @15138 has 42 MA's), (54, 15267), (65, 15312), (67, 15315), (70, 15333), (74, 15348), (86, 15420), (100, 15477), (101, 15495),

Gene: Gumball\_20 Start: 13498, Stop: 13917, Start Num: 18

Candidate Starts for Gumball\_20:

(Start: 18 @13498 has 20 MA's), (25, 13513), (36, 13552), (50, 13609), (57, 13630), (67, 13666), (71, 13687), (86, 13771), (94, 13813), (109, 13897),

Gene: Hager\_24 Start: 11963, Stop: 12391, Start Num: 15

Candidate Starts for Hager\_24:

(Start: 15 @11963 has 40 MA's), (52, 12089), (61, 12116), (62, 12119), (63, 12125), (89, 12260), (91, 12266), (97, 12296), (104, 12350),

Gene: Haunter\_23 Start: 11805, Stop: 12233, Start Num: 15

Candidate Starts for Haunter\_23:

(Start: 15 @11805 has 40 MA's), (52, 11931), (61, 11958), (62, 11961), (63, 11967), (89, 12102), (97, 12138), (104, 12192),

Gene: Hawkeye\_23 Start: 13446, Stop: 13865, Start Num: 20

Candidate Starts for Hawkeye\_23:

(Start: 20 @13446 has 1 MA's), (24, 13458), (37, 13503), (50, 13557), (71, 13635), (73, 13641), (74, 13647), (87, 13722), (91, 13740), (95, 13764), (97, 13770), (99, 13776), (106, 13833), (109, 13845), (110, 13848), (112, 13857),

Gene: Helpful\_22 Start: 13548, Stop: 13967, Start Num: 18

Candidate Starts for Helpful\_22:

(Start: 18 @13548 has 20 MA's), (25, 13563), (36, 13602), (50, 13659), (57, 13680), (67, 13716), (71, 13737), (86, 13821), (94, 13863), (109, 13947),

Gene: Hiddenleaf\_22 Start: 11593, Stop: 12021, Start Num: 15

Candidate Starts for Hiddenleaf\_22:

(Start: 15 @11593 has 40 MA's), (45, 11698), (52, 11719), (56, 11731), (62, 11749), (63, 11755), (76, 11812), (86, 11875), (91, 11896),

Gene: Huwbert\_44 Start: 22718, Stop: 23137, Start Num: 17

Candidate Starts for Huwbert\_44:

(Start: 17 @22718 has 42 MA's), (28, 22748), (34, 22775), (44, 22817), (100, 23051), (109, 23117),

Gene: Indlulamithi\_18 Start: 11372, Stop: 11803, Start Num: 10

Candidate Starts for Indlulamithi\_18:

(Start: 10 @11372 has 14 MA's), (33, 11447), (66, 11543), (77, 11591), (88, 11654), (90, 11663),

Gene: JDawG\_22 Start: 12175, Stop: 12603, Start Num: 15

Candidate Starts for JDawG\_22:

(Start: 15 @12175 has 40 MA's), (45, 12280), (52, 12301), (56, 12313), (63, 12337), (86, 12457), (91, 12478),

Gene: Jalebi\_21 Start: 15314, Stop: 15742, Start Num: 17

Candidate Starts for Jalebi\_21:

(16, 15311), (Start: 17 @15314 has 42 MA's), (54, 15443), (65, 15488), (67, 15491), (70, 15509), (74, 15524), (86, 15596), (100, 15653), (101, 15671),

Gene: Jamemuya19\_19 Start: 12378, Stop: 12806, Start Num: 17

Candidate Starts for Jamemuya19\_19:

(16, 12375), (Start: 17 @12378 has 42 MA's), (54, 12507), (65, 12552), (67, 12555), (70, 12573), (74, 12588), (86, 12660), (100, 12717), (101, 12735),

Gene: JingleBells\_22 Start: 11674, Stop: 12102, Start Num: 15

Candidate Starts for JingleBells\_22:

(Start: 15 @11674 has 40 MA's), (45, 11779), (52, 11800), (56, 11812), (62, 11830), (63, 11836), (76, 11893), (86, 11956), (91, 11977),

Gene: Karate\_22 Start: 11813, Stop: 12241, Start Num: 15

Candidate Starts for Karate\_22:

(Start: 15 @11813 has 40 MA's), (52, 11939), (61, 11966), (62, 11969), (63, 11975), (89, 12110), (97, 12146), (104, 12200),

Gene: Kate\_23 Start: 12400, Stop: 12828, Start Num: 15

Candidate Starts for Kate\_23:

(Start: 15 @12400 has 40 MA's), (52, 12526), (61, 12553), (62, 12556), (63, 12562), (89, 12697), (97, 12733),

Gene: Konstantine\_25 Start: 14562, Stop: 15029, Start Num: 4

Candidate Starts for Konstantine\_25:

(Start: 4 @14562 has 11 MA's), (Start: 6 @14580 has 2 MA's), (33, 14649), (36, 14655), (64, 14751), (94, 14910), (96, 14916), (101, 14946), (109, 14994),

Gene: Kors\_24 Start: 12425, Stop: 12856, Start Num: 15

Candidate Starts for Kors\_24:

(Start: 13 @12422 has 2 MA's), (Start: 15 @12425 has 40 MA's), (Start: 17 @12431 has 42 MA's), (19, 12440), (31, 12473), (45, 12533), (56, 12566), (61, 12581), (62, 12584), (71, 12626), (80, 12683), (87, 12713), (91, 12731), (98, 12764), (104, 12815), (108, 12830),

Gene: Krampus\_23 Start: 12398, Stop: 12826, Start Num: 15

Candidate Starts for Krampus\_23:

(Start: 15 @12398 has 40 MA's), (52, 12524), (61, 12551), (62, 12554), (63, 12560), (89, 12695), (97, 12731),

Gene: Labelle\_27 Start: 16745, Stop: 17146, Start Num: 14

Candidate Starts for Labelle\_27:

(Start: 14 @16745 has 3 MA's), (21, 16757), (39, 16814), (51, 16859), (55, 16868), (71, 16910), (74, 16922), (82, 16973), (87, 16997), (91, 17015), (109, 17120), (113, 17141),

Gene: Lambo\_21 Start: 14808, Stop: 15236, Start Num: 17

Candidate Starts for Lambo\_21:

(16, 14805), (Start: 17 @14808 has 42 MA's), (54, 14937), (65, 14982), (67, 14985), (70, 15003), (74, 15018), (86, 15090), (100, 15147), (101, 15165),

Gene: LavAbarElk\_19 Start: 13241, Stop: 13669, Start Num: 17

Candidate Starts for LavAbarElk\_19:

(16, 13238), (Start: 17 @13241 has 42 MA's), (25, 13265), (54, 13370), (65, 13415), (67, 13418), (70, 13436), (74, 13451), (86, 13523), (100, 13580), (101, 13598),

Gene: Leopard\_30 Start: 19290, Stop: 19724, Start Num: 7

Candidate Starts for Leopard\_30:

(Start: 6 @19287 has 2 MA's), (Start: 7 @19290 has 3 MA's), (Start: 29 @19341 has 1 MA's), (46, 19413), (60, 19452), (74, 19506), (75, 19512), (86, 19578), (94, 19620), (96, 19626), (101, 19656),

Gene: Lila22\_21 Start: 14762, Stop: 15190, Start Num: 17

Candidate Starts for Lila22\_21:

(16, 14759), (Start: 17 @14762 has 42 MA's), (54, 14891), (65, 14936), (67, 14939), (70, 14957), (74, 14972), (86, 15044), (100, 15101), (101, 15119),

Gene: LilyPad\_17 Start: 10585, Stop: 10992, Start Num: 11

Candidate Starts for LilyPad\_17:

(Start: 11 @10585 has 8 MA's), (42, 10678), (69, 10762), (71, 10768), (78, 10816), (88, 10861), (97, 10903), (109, 10978),

Gene: LittleFella\_18 Start: 12477, Stop: 12860, Start Num: 18

Candidate Starts for LittleFella\_18:

(1, 12273), (Start: 18 @12477 has 20 MA's), (Start: 29 @12495 has 1 MA's), (35, 12516), (40, 12528), (42, 12546), (79, 12693), (81, 12699), (86, 12723), (92, 12756), (93, 12759), (109, 12846), (111, 12852),

Gene: LordBart\_24 Start: 12341, Stop: 12772, Start Num: 15

Candidate Starts for LordBart\_24:

(Start: 13 @12338 has 2 MA's), (Start: 15 @12341 has 40 MA's), (Start: 17 @12347 has 42 MA's), (19, 12356), (31, 12389), (45, 12449), (56, 12482), (61, 12497), (62, 12500), (71, 12542), (80, 12599), (87, 12629), (91, 12647), (98, 12680), (104, 12731), (108, 12746),

Gene: LuckyLeo\_20 Start: 14093, Stop: 14521, Start Num: 17

Candidate Starts for LuckyLeo\_20:

(Start: 17 @14093 has 42 MA's), (25, 14117), (54, 14222), (65, 14267), (74, 14303), (77, 14321), (86, 14375), (100, 14432), (101, 14450),

Gene: Madi\_16 Start: 9866, Stop: 10276, Start Num: 11

Candidate Starts for Madi\_16:

(Start: 11 @9866 has 8 MA's), (22, 9881), (40, 9944), (42, 9962), (59, 9998), (73, 10058), (88, 10145), (94, 10178), (107, 10253), (109, 10262),

Gene: Madruga\_26 Start: 16414, Stop: 16815, Start Num: 14

Candidate Starts for Madruga\_26:

(Start: 14 @16414 has 3 MA's), (23, 16429), (39, 16483), (51, 16528), (71, 16579), (74, 16591), (82, 16642), (87, 16666), (91, 16684), (109, 16789), (113, 16810),

Gene: Megatron06\_22 Start: 13895, Stop: 14353, Start Num: 4

Candidate Starts for Megatron06\_22:

(Start: 4 @13895 has 11 MA's), (Start: 6 @13913 has 2 MA's), (33, 13982), (36, 13988), (64, 14084), (94, 14243), (96, 14249), (101, 14279), (109, 14327),

Gene: Mima20\_20 Start: 14491, Stop: 14919, Start Num: 17

Candidate Starts for Mima20\_20:

(16, 14488), (Start: 17 @14491 has 42 MA's), (25, 14515), (54, 14620), (65, 14665), (67, 14668), (70, 14686), (74, 14701), (86, 14773), (100, 14830), (101, 14848),

Gene: MoiGyank\_23 Start: 15175, Stop: 15603, Start Num: 17

Candidate Starts for MoiGyank\_23:

(16, 15172), (Start: 17 @15175 has 42 MA's), (54, 15304), (65, 15349), (67, 15352), (70, 15370), (74, 15385), (86, 15457), (100, 15514), (101, 15532),

Gene: MontyDev\_21 Start: 13570, Stop: 13998, Start Num: 10

Candidate Starts for MontyDev\_21:

(5, 13549), (Start: 10 @13570 has 14 MA's), (Start: 17 @13585 has 42 MA's), (33, 13645), (49, 13702), (85, 13837), (97, 13900), (102, 13930),

Gene: Mopey\_21 Start: 13548, Stop: 13967, Start Num: 18

Candidate Starts for Mopey\_21:

(Start: 18 @13548 has 20 MA's), (25, 13563), (36, 13602), (50, 13659), (57, 13680), (67, 13716), (71, 13737), (86, 13821), (94, 13863), (109, 13947),

Gene: MortySmith\_21 Start: 11572, Stop: 12000, Start Num: 15

Candidate Starts for MortySmith\_21:

(Start: 15 @11572 has 40 MA's), (45, 11677), (52, 11698), (56, 11710), (63, 11734), (86, 11854), (91, 11875),

Gene: MrMiyagi\_15 Start: 9282, Stop: 9695, Start Num: 10

Candidate Starts for MrMiyagi\_15:

(Start: 10 @9282 has 14 MA's), (27, 9327), (48, 9411), (66, 9453), (68, 9465), (72, 9474), (94, 9597), (109, 9681),

Gene: NarutoRun\_23 Start: 12391, Stop: 12819, Start Num: 15

Candidate Starts for NarutoRun\_23:

(Start: 15 @12391 has 40 MA's), (52, 12517), (61, 12544), (62, 12547), (63, 12553), (89, 12688), (97, 12724),

Gene: Neptune\_23 Start: 12368, Stop: 12796, Start Num: 15

Candidate Starts for Neptune\_23:

(Start: 15 @12368 has 40 MA's), (52, 12494), (61, 12521), (62, 12524), (63, 12530), (89, 12665), (97, 12701),

Gene: Nilo\_22 Start: 13909, Stop: 14337, Start Num: 10

Candidate Starts for Nilo\_22:

(5, 13888), (Start: 10 @13909 has 14 MA's), (Start: 17 @13924 has 42 MA's), (33, 13984), (49, 14041), (85, 14176), (97, 14239), (102, 14269),

Gene: Nish23\_21 Start: 13361, Stop: 13819, Start Num: 4

Candidate Starts for Nish23\_21:

(Start: 4 @13361 has 11 MA's), (Start: 6 @13379 has 2 MA's), (33, 13448), (36, 13454), (64, 13550), (94, 13709), (96, 13715), (101, 13745), (109, 13793),

Gene: NorManre\_22 Start: 14370, Stop: 14798, Start Num: 17

Candidate Starts for NorManre\_22:

(16, 14367), (Start: 17 @14370 has 42 MA's), (54, 14499), (65, 14544), (67, 14547), (70, 14565), (74, 14580), (86, 14652), (100, 14709), (101, 14727),

Gene: Nova\_21 Start: 13975, Stop: 14394, Start Num: 18

Candidate Starts for Nova\_21:

(Start: 18 @13975 has 20 MA's), (25, 13990), (36, 14029), (50, 14086), (57, 14107), (67, 14143), (71, 14164), (86, 14248), (94, 14290), (109, 14374),

Gene: NovaSharks\_20 Start: 12378, Stop: 12806, Start Num: 17

Candidate Starts for NovaSharks\_20:

(16, 12375), (Start: 17 @12378 has 42 MA's), (54, 12507), (65, 12552), (67, 12555), (70, 12573), (74, 12588), (86, 12660), (100, 12717), (101, 12735),

Gene: Oaker\_20 Start: 13619, Stop: 14077, Start Num: 4

Candidate Starts for Oaker\_20:

(Start: 4 @13619 has 11 MA's), (Start: 6 @13637 has 2 MA's), (33, 13706), (36, 13712), (64, 13808), (94, 13967), (96, 13973), (101, 14003), (109, 14051),

Gene: OhDear\_23 Start: 12397, Stop: 12825, Start Num: 15

Candidate Starts for OhDear\_23:

(Start: 15 @12397 has 40 MA's), (52, 12523), (61, 12550), (62, 12553), (63, 12559), (89, 12694), (97, 12730),

Gene: Onyinye\_31 Start: 19171, Stop: 19605, Start Num: 7

Candidate Starts for Onyinye\_31:

(Start: 6 @19168 has 2 MA's), (Start: 7 @19171 has 3 MA's), (Start: 29 @19222 has 1 MA's), (46, 19294), (60, 19333), (74, 19387), (75, 19393), (86, 19459), (94, 19501), (96, 19507), (101, 19537),

Gene: OtterstedtS21\_21 Start: 14460, Stop: 14888, Start Num: 17

Candidate Starts for OtterstedtS21\_21:

(16, 14457), (Start: 17 @14460 has 42 MA's), (54, 14589), (65, 14634), (67, 14637), (70, 14655), (74, 14670), (86, 14742), (100, 14799), (101, 14817),

Gene: OverHedge\_23 Start: 12365, Stop: 12793, Start Num: 15

Candidate Starts for OverHedge\_23:

(Start: 15 @12365 has 40 MA's), (52, 12491), (61, 12518), (62, 12521), (63, 12527), (89, 12662), (97, 12698),

Gene: PBI1\_22 Start: 13479, Stop: 13898, Start Num: 18

Candidate Starts for PBI1\_22:

(Start: 18 @13479 has 20 MA's), (25, 13494), (36, 13533), (50, 13590), (57, 13611), (67, 13647), (71, 13668), (86, 13752), (94, 13794), (109, 13878),

Gene: PLOT\_22 Start: 13551, Stop: 13970, Start Num: 18

Candidate Starts for PLOT\_22:

(Start: 18 @13551 has 20 MA's), (25, 13566), (36, 13605), (50, 13662), (57, 13683), (67, 13719), (71, 13740), (86, 13824), (94, 13866), (109, 13950),

Gene: Papyrus\_21 Start: 13571, Stop: 13999, Start Num: 10

Candidate Starts for Papyrus\_21:

(5, 13550), (Start: 10 @13571 has 14 MA's), (Start: 17 @13586 has 42 MA's), (33, 13646), (49, 13703), (85, 13838), (97, 13901), (102, 13931),

Gene: ParvusTarda\_21 Start: 13942, Stop: 14370, Start Num: 17

Candidate Starts for ParvusTarda\_21:

(16, 13939), (Start: 17 @13942 has 42 MA's), (54, 14071), (65, 14116), (67, 14119), (70, 14137), (74, 14152), (86, 14224), (100, 14281), (101, 14299),

Gene: Patience\_28 Start: 17304, Stop: 17705, Start Num: 14

Candidate Starts for Patience\_28:

(Start: 14 @17304 has 3 MA's), (39, 17373), (51, 17418), (55, 17427), (71, 17469), (74, 17481), (82, 17532), (87, 17556), (91, 17574), (109, 17679), (113, 17700),

Gene: Patos\_22 Start: 14370, Stop: 14798, Start Num: 17

Candidate Starts for Patos\_22:

(16, 14367), (Start: 17 @14370 has 42 MA's), (54, 14499), (65, 14544), (67, 14547), (70, 14565), (74, 14580), (86, 14652), (100, 14709), (101, 14727),

Gene: Penelope2018\_21 Start: 13548, Stop: 13967, Start Num: 18

Candidate Starts for Penelope2018\_21:

(Start: 18 @13548 has 20 MA's), (25, 13563), (36, 13602), (50, 13659), (57, 13680), (67, 13716), (71, 13737), (86, 13821), (94, 13863), (109, 13947),

Gene: Phalaborwa\_21 Start: 13581, Stop: 14000, Start Num: 18

Candidate Starts for Phalaborwa\_21:

(Start: 18 @13581 has 20 MA's), (25, 13596), (36, 13635), (41, 13656), (57, 13713), (67, 13749), (74, 13782), (88, 13863), (94, 13896), (102, 13935), (109, 13980),

Gene: Pharpay\_23 Start: 12413, Stop: 12841, Start Num: 15

Candidate Starts for Pharpay\_23:

(Start: 15 @12413 has 40 MA's), (52, 12539), (61, 12566), (62, 12569), (63, 12575), (89, 12710), (97, 12746),

Gene: Phreeze\_20 Start: 13360, Stop: 13818, Start Num: 4

Candidate Starts for Phreeze\_20:

(Start: 4 @13360 has 11 MA's), (Start: 6 @13378 has 2 MA's), (33, 13447), (36, 13453), (64, 13549), (94, 13708), (96, 13714), (101, 13744), (109, 13792),

Gene: PhunaPhoke\_23 Start: 12386, Stop: 12814, Start Num: 15

Candidate Starts for PhunaPhoke\_23:

(Start: 15 @12386 has 40 MA's), (52, 12512), (61, 12539), (62, 12542), (63, 12548), (89, 12683), (97, 12719),

Gene: Potty\_23 Start: 12391, Stop: 12819, Start Num: 15

Candidate Starts for Potty\_23:

(Start: 15 @12391 has 40 MA's), (52, 12517), (61, 12544), (62, 12547), (63, 12553), (89, 12688), (97, 12724),

Gene: Poultriss\_22 Start: 12164, Stop: 12592, Start Num: 15

Candidate Starts for Poultriss\_22:

(Start: 15 @12164 has 40 MA's), (52, 12290), (61, 12317), (62, 12320), (63, 12326), (89, 12461), (97, 12497),

Gene: Prager\_21 Start: 13560, Stop: 13979, Start Num: 18

Candidate Starts for Prager\_21:

(Start: 18 @13560 has 20 MA's), (25, 13575), (36, 13614), (50, 13671), (57, 13692), (67, 13728), (71, 13749), (86, 13833), (94, 13875), (109, 13959),

Gene: Predator\_24 Start: 14885, Stop: 15343, Start Num: 4

Candidate Starts for Predator\_24:

(Start: 4 @14885 has 11 MA's), (Start: 6 @14903 has 2 MA's), (8, 14909), (32, 14969), (36, 14978), (64, 15074), (70, 15104), (85, 15179), (90, 15209), (96, 15239), (97, 15242), (101, 15269), (109, 15317),

Gene: Puissant\_21 Start: 13816, Stop: 14274, Start Num: 4

Candidate Starts for Puissant\_21:

(Start: 4 @13816 has 11 MA's), (Start: 6 @13834 has 2 MA's), (Start: 18 @13858 has 20 MA's), (26, 13873), (33, 13903), (36, 13909), (64, 14005), (77, 14068), (96, 14170), (101, 14200), (109, 14248),

Gene: Pywacket\_20 Start: 15299, Stop: 15727, Start Num: 17

Candidate Starts for Pywacket\_20:

(16, 15296), (Start: 17 @15299 has 42 MA's), (54, 15428), (65, 15473), (67, 15476), (70, 15494), (74, 15509), (86, 15581), (100, 15638), (101, 15656),

Gene: Rachella\_23 Start: 12394, Stop: 12822, Start Num: 15

Candidate Starts for Rachella\_23:

(Start: 15 @12394 has 40 MA's), (52, 12520), (61, 12547), (62, 12550), (63, 12556), (89, 12691), (97, 12727),

Gene: Ranch\_21 Start: 13308, Stop: 13736, Start Num: 17

Candidate Starts for Ranch\_21:

(16, 13305), (Start: 17 @13308 has 42 MA's), (54, 13437), (65, 13482), (67, 13485), (70, 13503), (74, 13518), (86, 13590), (100, 13647), (101, 13665),

Gene: RazorC\_19 Start: 12378, Stop: 12806, Start Num: 17

Candidate Starts for RazorC\_19:

(16, 12375), (Start: 17 @12378 has 42 MA's), (54, 12507), (65, 12552), (67, 12555), (70, 12573), (74, 12588), (86, 12660), (100, 12717), (101, 12735),

Gene: Riduram\_19 Start: 12348, Stop: 12776, Start Num: 17

Candidate Starts for Riduram\_19:

(16, 12345), (Start: 17 @12348 has 42 MA's), (54, 12477), (65, 12522), (67, 12525), (70, 12543), (74, 12558), (86, 12630), (100, 12687), (101, 12705),

Gene: Rie18\_23 Start: 11745, Stop: 12173, Start Num: 15

Candidate Starts for Rie18\_23:

(Start: 15 @11745 has 40 MA's), (52, 11871), (61, 11898), (62, 11901), (63, 11907), (89, 12042), (91, 12048), (97, 12078), (104, 12132),

Gene: RikSengupta\_24 Start: 12459, Stop: 12893, Start Num: 13

Candidate Starts for RikSengupta\_24:

(Start: 13 @12459 has 2 MA's), (Start: 15 @12462 has 40 MA's), (Start: 17 @12468 has 42 MA's), (19, 12477), (31, 12510), (45, 12570), (56, 12603), (61, 12618), (62, 12621), (71, 12663), (80, 12720), (87, 12750), (91, 12768), (98, 12801), (104, 12852), (108, 12867),

Gene: Riparian\_21 Start: 13370, Stop: 13798, Start Num: 10

Candidate Starts for Riparian\_21:

(5, 13349), (Start: 10 @13370 has 14 MA's), (Start: 17 @13385 has 42 MA's), (33, 13445), (49, 13502), (85, 13637), (97, 13700), (102, 13730),

Gene: Rope\_21 Start: 13562, Stop: 13990, Start Num: 10

Candidate Starts for Rope\_21:

(5, 13541), (Start: 10 @13562 has 14 MA's), (Start: 17 @13577 has 42 MA's), (33, 13637), (49, 13694), (85, 13829), (97, 13892), (102, 13922),

Gene: Rota\_20 Start: 14266, Stop: 14694, Start Num: 17

Candidate Starts for Rota\_20:

(16, 14263), (Start: 17 @14266 has 42 MA's), (54, 14395), (65, 14440), (67, 14443), (70, 14461), (74, 14476), (86, 14548), (100, 14605), (101, 14623),

Gene: Rukungu\_21 Start: 15007, Stop: 15435, Start Num: 17

Candidate Starts for Rukungu\_21:

(16, 15004), (Start: 17 @15007 has 42 MA's), (54, 15136), (65, 15181), (67, 15184), (70, 15202), (74, 15217), (86, 15289), (100, 15346), (101, 15364),

Gene: Rumi\_20 Start: 12378, Stop: 12806, Start Num: 17

Candidate Starts for Rumi\_20:

(16, 12375), (Start: 17 @12378 has 42 MA's), (54, 12507), (65, 12552), (67, 12555), (70, 12573), (74, 12588), (86, 12660), (100, 12717), (101, 12735),

Gene: Sadboi\_21 Start: 15138, Stop: 15566, Start Num: 17

Candidate Starts for Sadboi\_21:

(16, 15135), (Start: 17 @15138 has 42 MA's), (54, 15267), (65, 15312), (67, 15315), (70, 15333), (74, 15348), (86, 15420), (100, 15477), (101, 15495),

Gene: Sampudon\_21 Start: 15314, Stop: 15742, Start Num: 17

Candidate Starts for Sampudon\_21:

(16, 15311), (Start: 17 @15314 has 42 MA's), (54, 15443), (65, 15488), (67, 15491), (70, 15509), (74, 15524), (86, 15596), (100, 15653), (101, 15671),

Gene: Send513\_21 Start: 13912, Stop: 14340, Start Num: 10

Candidate Starts for Send513\_21:

(5, 13891), (Start: 10 @13912 has 14 MA's), (Start: 17 @13927 has 42 MA's), (33, 13987), (49, 14044), (85, 14179), (97, 14242), (102, 14272),

Gene: Shrew\_56 Start: 27170, Stop: 27589, Start Num: 17

Candidate Starts for Shrew\_56:

(Start: 17 @27170 has 42 MA's), (28, 27200), (34, 27227), (38, 27239), (44, 27272), (47, 27284), (59, 27314), (86, 27443), (103, 27545),

Gene: Sienna\_16 Start: 9866, Stop: 10276, Start Num: 11

Candidate Starts for Sienna\_16:

(Start: 11 @9866 has 8 MA's), (22, 9881), (40, 9944), (42, 9962), (59, 9998), (73, 10058), (88, 10145), (94, 10178), (107, 10253), (109, 10262),

Gene: SilentWarrior\_22 Start: 11601, Stop: 12029, Start Num: 15

Candidate Starts for SilentWarrior\_22:

(Start: 15 @11601 has 40 MA's), (39, 11682), (45, 11706), (52, 11727), (56, 11739), (62, 11757), (63, 11763), (76, 11820), (86, 11883), (91, 11904),

Gene: SirHarley\_20 Start: 13480, Stop: 13899, Start Num: 18

Candidate Starts for SirHarley\_20:

(Start: 18 @13480 has 20 MA's), (25, 13495), (36, 13534), (50, 13591), (57, 13612), (67, 13648), (71, 13669), (86, 13753), (94, 13795), (109, 13879),

Gene: Snakehole\_24 Start: 11690, Stop: 12118, Start Num: 15

Candidate Starts for Snakehole\_24:

(Start: 15 @11690 has 40 MA's), (45, 11795), (52, 11816), (56, 11828), (62, 11846), (63, 11852), (76, 11909), (86, 11972), (91, 11993),

Gene: Sparcetus\_24 Start: 12338, Stop: 12772, Start Num: 13

Candidate Starts for Sparcetus\_24:

(Start: 13 @12338 has 2 MA's), (Start: 15 @12341 has 40 MA's), (Start: 17 @12347 has 42 MA's), (19, 12356), (31, 12389), (45, 12449), (56, 12482), (61, 12497), (62, 12500), (71, 12542), (80, 12599), (87, 12629), (91, 12647), (98, 12680), (104, 12731), (108, 12746),

Gene: Stormer\_19 Start: 12378, Stop: 12806, Start Num: 17

Candidate Starts for Stormer\_19:

(16, 12375), (Start: 17 @12378 has 42 MA's), (54, 12507), (65, 12552), (67, 12555), (70, 12573), (74, 12588), (86, 12660), (100, 12717), (101, 12735),

Gene: SuperSonics\_27 Start: 16471, Stop: 16872, Start Num: 14

Candidate Starts for SuperSonics\_27:

(Start: 14 @16471 has 3 MA's), (21, 16483), (39, 16540), (51, 16585), (55, 16594), (71, 16636), (74, 16648), (82, 16699), (87, 16723), (91, 16741), (109, 16846), (113, 16867),

Gene: SuperheroCarly\_21 Start: 13410, Stop: 13829, Start Num: 18

Candidate Starts for SuperheroCarly\_21:

(Start: 18 @13410 has 20 MA's), (25, 13425), (36, 13464), (50, 13521), (57, 13542), (67, 13578), (71, 13599), (86, 13683), (94, 13725), (109, 13809),

Gene: Suzy\_17 Start: 11094, Stop: 11504, Start Num: 11

Candidate Starts for Suzy\_17:

(Start: 11 @11094 has 8 MA's), (22, 11109), (40, 11172), (42, 11190), (54, 11214), (73, 11286), (78, 11328), (81, 11340), (94, 11406), (107, 11481), (109, 11490),

Gene: Tedro\_23 Start: 11864, Stop: 12292, Start Num: 15

Candidate Starts for Tedro\_23:

(Start: 15 @11864 has 40 MA's), (52, 11990), (61, 12017), (62, 12020), (63, 12026), (89, 12161), (97, 12197),

Gene: Terapin\_16 Start: 9866, Stop: 10276, Start Num: 11

Candidate Starts for Terapin\_16:

(Start: 11 @9866 has 8 MA's), (22, 9881), (40, 9944), (42, 9962), (59, 9998), (73, 10058), (88, 10145), (94, 10178), (107, 10253), (109, 10262),

Gene: Thoth\_21 Start: 13545, Stop: 13964, Start Num: 18

Candidate Starts for Thoth\_21:

(Start: 18 @13545 has 20 MA's), (25, 13560), (36, 13599), (50, 13656), (57, 13677), (67, 13713), (71, 13734), (86, 13818), (94, 13860), (109, 13944),

Gene: Thumb\_20 Start: 13361, Stop: 13819, Start Num: 4

Candidate Starts for Thumb\_20:

(Start: 4 @13361 has 11 MA's), (Start: 6 @13379 has 2 MA's), (33, 13448), (36, 13454), (64, 13550), (94, 13709), (96, 13715), (101, 13745), (109, 13793),

Gene: Tiggy93\_23 Start: 12397, Stop: 12825, Start Num: 15

Candidate Starts for Tiggy93\_23:

(Start: 15 @12397 has 40 MA's), (52, 12523), (61, 12550), (62, 12553), (63, 12559), (89, 12694), (97, 12730),

Gene: Tillicus\_21 Start: 13687, Stop: 14115, Start Num: 17

Candidate Starts for Tillicus\_21:

(Start: 17 @13687 has 42 MA's), (25, 13711), (54, 13816), (65, 13861), (74, 13897), (77, 13915), (86, 13969), (100, 14026), (101, 14044),

Gene: TinyMiny\_24 Start: 12360, Stop: 12791, Start Num: 15

Candidate Starts for TinyMiny\_24:

(Start: 13 @12357 has 2 MA's), (Start: 15 @12360 has 40 MA's), (Start: 17 @12366 has 42 MA's), (19, 12375), (31, 12408), (45, 12468), (56, 12501), (61, 12516), (62, 12519), (71, 12561), (80, 12618), (87, 12648), (91, 12666), (98, 12699), (104, 12750), (108, 12765),

Gene: Tongui\_22 Start: 11737, Stop: 12165, Start Num: 15

Candidate Starts for Tongui\_22:

(Start: 15 @11737 has 40 MA's), (52, 11863), (61, 11890), (62, 11893), (63, 11899), (89, 12034), (97, 12070), (104, 12124),

Gene: Triscuit\_43 Start: 22633, Stop: 23052, Start Num: 17

Candidate Starts for Triscuit\_43:

(Start: 17 @22633 has 42 MA's), (28, 22663), (34, 22690), (44, 22732), (100, 22966), (109, 23032),

Gene: Troll4\_21 Start: 13549, Stop: 13968, Start Num: 18

Candidate Starts for Troll4\_21:

(Start: 18 @13549 has 20 MA's), (25, 13564), (36, 13603), (50, 13660), (57, 13681), (67, 13717), (71, 13738), (86, 13822), (94, 13864), (109, 13948),

Gene: Visconti\_21 Start: 13558, Stop: 13977, Start Num: 18

Candidate Starts for Visconti\_21:

(Start: 18 @13558 has 20 MA's), (25, 13573), (36, 13612), (50, 13669), (57, 13690), (67, 13726), (71, 13747), (86, 13831), (94, 13873), (109, 13957),

Gene: WaldoWhy\_22 Start: 13554, Stop: 13973, Start Num: 18

Candidate Starts for WaldoWhy\_22:

(Start: 18 @13554 has 20 MA's), (25, 13569), (36, 13608), (50, 13665), (57, 13686), (67, 13722), (71, 13743), (86, 13827), (94, 13869), (109, 13953),

Gene: Weiss13\_21 Start: 13602, Stop: 14030, Start Num: 10

Candidate Starts for Weiss13\_21:

(5, 13581), (Start: 10 @13602 has 14 MA's), (Start: 17 @13617 has 42 MA's), (49, 13734), (85, 13869), (97, 13932), (102, 13962),

Gene: Wojtek\_20 Start: 14015, Stop: 14443, Start Num: 17

Candidate Starts for Wojtek\_20:

(16, 14012), (Start: 17 @14015 has 42 MA's), (54, 14144), (65, 14189), (67, 14192), (70, 14210), (74, 14225), (86, 14297), (100, 14354), (101, 14372),

Gene: Wollypog\_11 Start: 8956, Stop: 9348, Start Num: 29

Candidate Starts for Wollypog\_11:

(2, 8746), (3, 8866), (Start: 29 @8956 has 1 MA's), (43, 9025), (56, 9061), (57, 9064), (74, 9133), (76, 9139), (88, 9211), (105, 9313),

Gene: Xenia2\_21 Start: 14054, Stop: 14482, Start Num: 17

Candidate Starts for Xenia2\_21:

(Start: 17 @14054 has 42 MA's), (54, 14183), (65, 14228), (67, 14231), (84, 14321), (86, 14336), (100, 14393),

Gene: Yelo\_21 Start: 13912, Stop: 14340, Start Num: 10

Candidate Starts for Yelo\_21:

(5, 13891), (Start: 10 @13912 has 14 MA's), (Start: 17 @13927 has 42 MA's), (33, 13987), (49, 14044), (85, 14179), (97, 14242), (102, 14272),

Gene: Yikes\_22 Start: 15399, Stop: 15827, Start Num: 17

Candidate Starts for Yikes\_22:

(16, 15396), (Start: 17 @15399 has 42 MA's), (54, 15528), (65, 15573), (67, 15576), (70, 15594), (74, 15609), (86, 15681), (100, 15738), (101, 15756),

Gene: Zany\_20 Start: 14528, Stop: 14956, Start Num: 17

Candidate Starts for Zany\_20:

(16, 14525), (Start: 17 @14528 has 42 MA's), (25, 14552), (54, 14657), (65, 14702), (67, 14705), (70, 14723), (74, 14738), (86, 14810), (100, 14867), (101, 14885),

Gene: Zenon\_22 Start: 13914, Stop: 14342, Start Num: 10

Candidate Starts for Zenon\_22:

(5, 13893), (Start: 10 @13914 has 14 MA's), (Start: 17 @13929 has 42 MA's), (33, 13989), (49, 14046), (85, 14181), (97, 14244), (102, 14274),