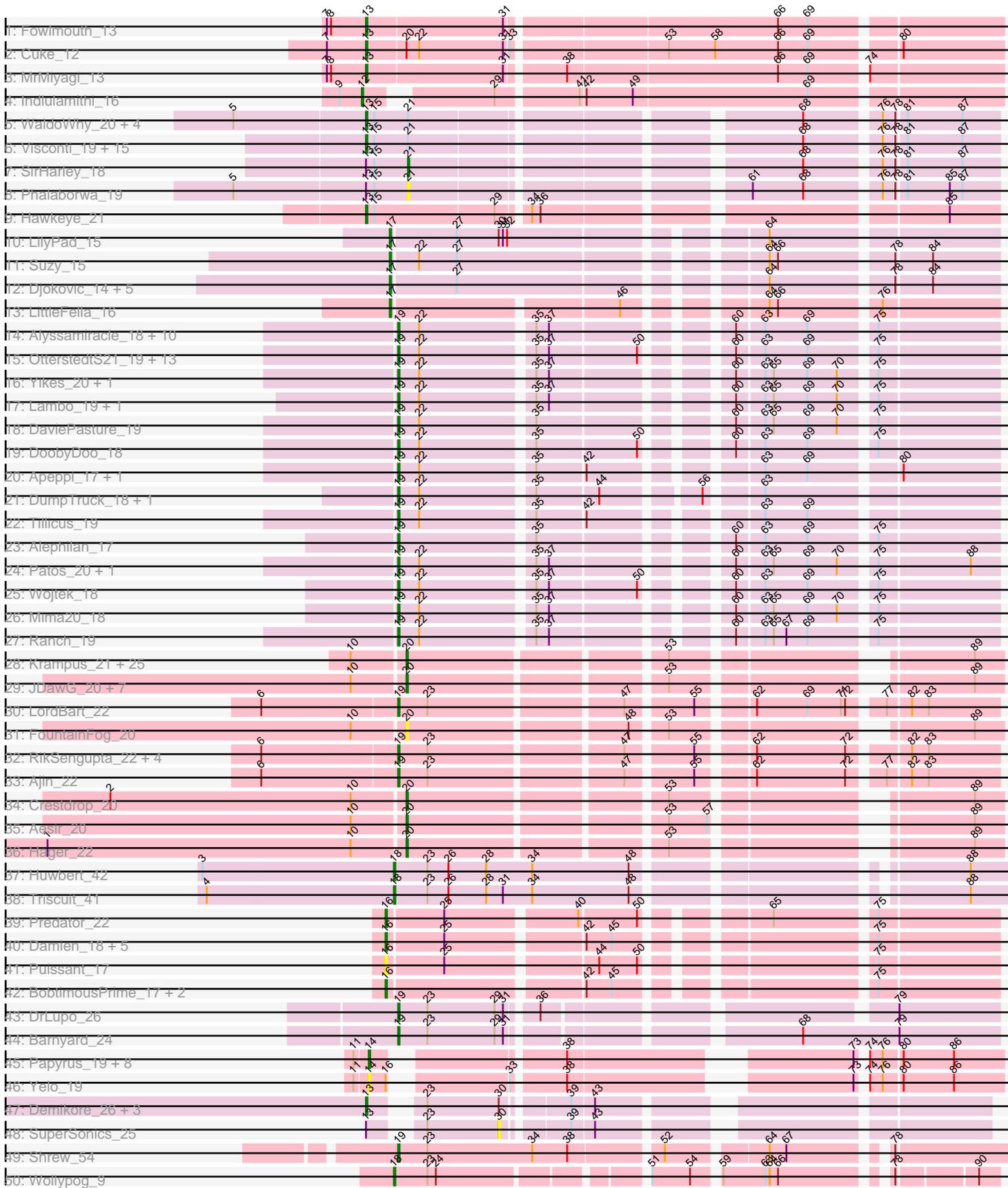


Pham 283552



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 283552 Report

This analysis was run 02/23/26 on database version 636.

Pham number 283552 has 156 members, 16 are drafts.

Phages represented in each track:

- Track 1 : Fowlmouth\_13
- Track 2 : Cuke\_12
- Track 3 : MrMiyagi\_13
- Track 4 : Indlulamithi\_16
- Track 5 : WaldoWhy\_20, Chill\_20, Delton\_19, BigMama\_17, Prager\_19
- Track 6 : Visconti\_19, Butterscotch\_19, KandZ\_19, Gumball\_18, Thoth\_19, Nova\_19, Adjutor\_20, Penelope2018\_19, PLOT\_20, Troll4\_19, Erk16\_19, Giuseppe\_19, SuperheroCarly\_20, Mopey\_19, Helpful\_20, PBI1\_20
- Track 7 : SirHarley\_18
- Track 8 : Phalaborwa\_19
- Track 9 : Hawkeye\_21
- Track 10 : LilyPad\_15
- Track 11 : Suzy\_15
- Track 12 : Djokovic\_14, Madi\_14, Terapin\_14, BiteSize\_14, Sienna\_14, Beyoncage\_14
- Track 13 : LittleFella\_16
- Track 14 : Alyssamiracle\_18, Rumi\_18, Astralis\_17, Charminar\_17, Stormer\_17, Genamy16\_18, Zany\_18, NovaSharks\_18, Avian\_17, Jamemuya19\_17, RazorC\_17
- Track 15 : OtterstedtS21\_19, Gibbin\_20, Fulcrum\_20, Lila22\_19, Sampudon\_19, GretelLyn\_19, MoiGyank\_21, Sadboi\_19, LavAbarElk\_17, Jalebi\_19, BirthdayBoy\_20, GOATification\_20, Rota\_18, Rukungu\_19
- Track 16 : Yikes\_20, ParvusTarda\_19
- Track 17 : Lambo\_19, Erutan\_19
- Track 18 : DaviePasture\_19
- Track 19 : DoobyDoo\_18
- Track 20 : Apeppi\_17, LuckyLeo\_18
- Track 21 : DumpTruck\_18, Xenia2\_19
- Track 22 : Tillicus\_19
- Track 23 : Alephilan\_17
- Track 24 : Patos\_20, NorManre\_20
- Track 25 : Wojtek\_18
- Track 26 : Mima20\_18
- Track 27 : Ranch\_19
- Track 28 : Krampus\_21, Chivey\_20, Hiddenleaf\_20, Neptune\_21, Pharpay\_21, Gilda\_21, Anakin\_21, Rachella\_21, DannyDe\_20, Poultruss\_20, Haunter\_21, Kate\_21, AnnaSerena\_21, CoolCookie\_21, FreddieHg\_20, OhDear\_21, SilentWarrior\_20, Potty\_21, Artiphact\_21, Tedro\_21, JingleBells\_20, Cybele\_21,

- OverHedge\_21, NarutoRun\_21, PhunaPhoke\_21, Snakehole\_22
- Track 29 : JDawG\_20, Rie18\_21, Dauntless\_20, MortySmith\_19, Annapurna\_20, Erudite\_20, Karate\_20, Tongui\_20
  - Track 30 : LordBart\_22
  - Track 31 : FountainFog\_20
  - Track 32 : RikSengupta\_22, TinyMiny\_22, Kors\_22, Bramble\_22, Sparcetus\_22
  - Track 33 : Ajin\_22
  - Track 34 : Crestdrop\_20
  - Track 35 : Aesir\_20
  - Track 36 : Hager\_22
  - Track 37 : Huwbert\_42
  - Track 38 : Triscuit\_41
  - Track 39 : Predator\_22
  - Track 40 : Damien\_18, Cborch11\_19, Phreeze\_18, Konstantine\_23, Beckerton\_18, Oaker\_18
  - Track 41 : Puissant\_17
  - Track 42 : BobtimousPrime\_17, Megatron06\_20, Thumb\_18
  - Track 43 : DrLupo\_26
  - Track 44 : Barnyard\_24
  - Track 45 : Papyrus\_19, MontyDev\_19, Send513\_19, Nilo\_20, Candle\_19, Weiss13\_19, Riparian\_19, Rope\_19, Zenon\_20
  - Track 46 : Yelo\_19
  - Track 47 : Demikore\_26, Patience\_26, Labelle\_25, Madruga\_24
  - Track 48 : SuperSonics\_25
  - Track 49 : Shrew\_54
  - Track 50 : 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 19, it was called in 47 of the 140 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Ajin\_22, Alephilan\_17, Alyssamiracle\_18, Apeppi\_17, Astralis\_17, Avian\_17, Barnyard\_24, BirthdayBoy\_20, Bramble\_22, Charminar\_17, DaviePasture\_19, DoobyDoo\_18, DrLupo\_26, DumpTruck\_18, Erutan\_19, Fulcrum\_20, GOATification\_20, Genamy16\_18, Gibbin\_20, GretelLyn\_19, Jalebi\_19, Jamemuya19\_17, Kors\_22, Lambo\_19, LavAbarElk\_17, Lila22\_19, LordBart\_22, LuckyLeo\_18, Mima20\_18, MoiGyank\_21, NorManre\_20, NovaSharks\_18, OtterstedtS21\_19, ParvusTarda\_19, Patos\_20, Ranch\_19, RazorC\_17, RikSengupta\_22, Rota\_18, Rukungu\_19, Rumi\_18, Sadboi\_19, Sampudon\_19, Shrew\_54, Sparcetus\_22, Stormer\_17, Tillicus\_19, TinyMiny\_22, Wojtek\_18, Xenia2\_19, 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, Anakin\_21, AnnaSerena\_21, Annapurna\_20, Artiphact\_21, Beckerton\_18, Beyoncage\_14, BigMama\_17, BiteSize\_14, BobtimousPrime\_17,

Butterscotch\_19, Candle\_19, Cborch11\_19, Chill\_20, Chivey\_20, CoolCookie\_21, Crestdrop\_20, Cuke\_12, Cybele\_21, Damien\_18, DannyDe\_20, Dauntless\_20, Delton\_19, Demikore\_26, Djokovic\_14, Erk16\_19, Erudite\_20, FountainFog\_20, Fowlmouth\_13, FreddieHg\_20, Gilda\_21, Giuseppe\_19, Gumball\_18, Hager\_22, Haunter\_21, Hawkeye\_21, Helpful\_20, Hiddenleaf\_20, Huwbert\_42, Indulamithi\_16, JDawG\_20, JingleBells\_20, KandZ\_19, Karate\_20, Kate\_21, Konstantine\_23, Krampus\_21, Labelle\_25, LilyPad\_15, LittleFella\_16, Madi\_14, Madrugua\_24, Megatron06\_20, MontyDev\_19, Mopey\_19, MortySmith\_19, MrMiyagi\_13, NarutoRun\_21, Neptune\_21, Nilo\_20, Nova\_19, Oaker\_18, OhDear\_21, OverHedge\_21, PBI1\_20, PLOT\_20, Papyrus\_19, Patience\_26, Penelope2018\_19, Phalaborwa\_19, Pharpay\_21, Phreeze\_18, PhunaPhoke\_21, Potty\_21, Poultruss\_20, Prager\_19, Predator\_22, Puissant\_17, Rachella\_21, Rie18\_21, Riparian\_19, Rope\_19, Send513\_19, Sienna\_14, SilentWarrior\_20, SirHarley\_18, Snakehole\_22, SuperSonics\_25, SuperheroCarly\_20, Suzy\_15, Tedro\_21, Terapin\_14, Thoth\_19, Thumb\_18, Tongui\_20, Triscuit\_41, Troll4\_19, Visconti\_19, WaldoWhy\_20, Weiss13\_19, Wollypog\_9, Yelo\_19, Zenon\_20,

### Summary by start number:

#### Start 12:

- Found in 1 of 156 ( 0.6% ) of genes in pham
- Manual Annotations of this start: 1 of 140
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Indulamithi\_16 (AC),

#### Start 13:

- Found in 32 of 156 ( 20.5% ) of genes in pham
- Manual Annotations of this start: 27 of 140
- Called 90.6% of time when present
- Phage (with cluster) where this start called: Adjutor\_20 (D1), BigMama\_17 (D1), Butterscotch\_19 (D1), Chill\_20 (D1), Cuke\_12 (AC), Delton\_19 (D1), Demikore\_26 (U), Erk16\_19 (D1), Fowlmouth\_13 (AC), Giuseppe\_19 (D1), Gumball\_18 (D1), Hawkeye\_21 (D2), Helpful\_20 (D1), KandZ\_19 (D1), Labelle\_25 (U), Madrugua\_24 (U), Mopey\_19 (D1), MrMiyagi\_13 (AC), Nova\_19 (D1), PBI1\_20 (D1), PLOT\_20 (D1), Patience\_26 (U), Penelope2018\_19 (D1), Prager\_19 (D1), SuperheroCarly\_20 (D1), Thoth\_19 (D1), Troll4\_19 (D1), Visconti\_19 (D1), WaldoWhy\_20 (D1),

#### Start 14:

- Found in 10 of 156 ( 6.4% ) of genes in pham
- Manual Annotations of this start: 9 of 140
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Candle\_19 (R), MontyDev\_19 (R), Nilo\_20 (R), Papyrus\_19 (R), Riparian\_19 (R), Rope\_19 (R), Send513\_19 (R), Weiss13\_19 (R), Yelo\_19 (R), Zenon\_20 (R),

#### Start 16:

- Found in 12 of 156 ( 7.7% ) of genes in pham
- Manual Annotations of this start: 9 of 140
- Called 91.7% of time when present
- Phage (with cluster) where this start called: Beckerton\_18 (H1), BobtimousPrime\_17 (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 17:

- Found in 9 of 156 ( 5.8% ) of genes in pham
- Manual Annotations of this start: 9 of 140
- 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 18:

- Found in 3 of 156 ( 1.9% ) of genes in pham
- Manual Annotations of this start: 3 of 140
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Huwbert\_42 (GG), Triscuit\_41 (GG), Wollypog\_9 (singleton),

Start 19:

- Found in 52 of 156 ( 33.3% ) of genes in pham
- Manual Annotations of this start: 47 of 140
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Ajin\_22 (EF), Alephilan\_17 (DV), Alyssamiracle\_18 (DV), Apeppi\_17 (DV), Astralis\_17 (DV), Avian\_17 (DV), Barnyard\_24 (H2), BirthdayBoy\_20 (DV), Bramble\_22 (EF), Charminar\_17 (DV), DaviePasture\_19 (DV), DoobyDoo\_18 (DV), DrLupo\_26 (H2), DumpTruck\_18 (DV), Erutan\_19 (DV), Fulcrum\_20 (DV), GOATification\_20 (DV), Genamy16\_18 (DV), Gibbin\_20 (DV), GretelLyn\_19 (DV), Jalebi\_19 (DV), Jamemuya19\_17 (DV), Kors\_22 (EF), Lambo\_19 (DV), LavAbarElk\_17 (DV), Lila22\_19 (DV), LordBart\_22 (EF), LuckyLeo\_18 (DV), Mima20\_18 (DV), MoiGyank\_21 (DV), NorManre\_20 (DV), NovaSharks\_18 (DV), OtterstedtS21\_19 (DV), ParvusTarda\_19 (DV), Patos\_20 (DV), Ranch\_19 (DV), RazorC\_17 (DV), RikSengupta\_22 (EF), Rota\_18 (DV), Rukungu\_19 (DV), Rumi\_18 (DV), Sadboi\_19 (DV), Sampudon\_19 (DV), Shrew\_54 (singleton), Sparcetus\_22 (EF), Stormer\_17 (DV), Tillicus\_19 (DV), TinyMiny\_22 (EF), Wojtek\_18 (DV), Xenia2\_19 (DV), Yikes\_20 (DV), Zany\_18 (DV),

Start 20:

- Found in 39 of 156 ( 25.0% ) of genes in pham
- Manual Annotations of this start: 34 of 140
- Called 97.4% of time when present
- Phage (with cluster) where this start called: Aesir\_20 (EF), Anakin\_21 (EF), AnnaSerena\_21 (EF), Annapurna\_20 (EF), Artiphact\_21 (EF), Chivey\_20 (EF), CoolCookie\_21 (EF), Crestdrop\_20 (EF), Cybele\_21 (EF), DannyDe\_20 (EF), Dauntless\_20 (EF), Erudite\_20 (EF), FountainFog\_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), OhDear\_21 (EF), OverHedge\_21 (EF), Pharpay\_21 (EF), PhunaPhoke\_21 (EF), Potty\_21 (EF), Poultruss\_20 (EF), Rachella\_21 (EF), Rie18\_21 (EF), SilentWarrior\_20 (EF), Snakehole\_22 (EF), Tedro\_21 (EF), Tongui\_20 (EF),

Start 21:

- Found in 23 of 156 ( 14.7% ) of genes in pham
- Manual Annotations of this start: 1 of 140
- Called 8.7% of time when present

- Phage (with cluster) where this start called: Phalaborwa\_19 (D1), SirHarley\_18 (D1),

Start 30:

- Found in 6 of 156 ( 3.8% ) of genes in pham
- No Manual Annotations of this start.
- Called 16.7% of time when present
- Phage (with cluster) where this start called: SuperSonics\_25 (U),

### **Summary by clusters:**

There are 13 clusters represented in this pham: DG2, singleton, H1, H2, EF, AC, GG, DG1, U, DV, R, D2, D1,

Info for manual annotations of cluster AC:

- Start number 12 was manually annotated 1 time for cluster AC.
- Start number 13 was manually annotated 3 times for cluster AC.

Info for manual annotations of cluster D1:

- Start number 13 was manually annotated 20 times for cluster D1.
- Start number 21 was manually annotated 1 time for cluster D1.

Info for manual annotations of cluster D2:

- Start number 13 was manually annotated 1 time for cluster D2.

Info for manual annotations of cluster DG1:

- Start number 17 was manually annotated 8 times for cluster DG1.

Info for manual annotations of cluster DG2:

- Start number 17 was manually annotated 1 time for cluster DG2.

Info for manual annotations of cluster DV:

- Start number 19 was manually annotated 37 times for cluster DV.

Info for manual annotations of cluster EF:

- Start number 19 was manually annotated 7 times for cluster EF.
- Start number 20 was manually annotated 34 times for cluster EF.

Info for manual annotations of cluster GG:

- Start number 18 was manually annotated 2 times for cluster GG.

Info for manual annotations of cluster H1:

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

Info for manual annotations of cluster H2:

- Start number 19 was manually annotated 2 times for cluster H2.

Info for manual annotations of cluster R:

- Start number 14 was manually annotated 9 times for cluster R.

Info for manual annotations of cluster U:

- Start number 13 was manually annotated 3 times for cluster U.

**Gene Information:**

Gene: Adjutor\_20 Start: 12729, Stop: 13136, Start Num: 13

Candidate Starts for Adjutor\_20:

(Start: 13 @12729 has 27 MA's), (15, 12735), (Start: 21 @12759 has 1 MA's), (68, 13008), (76, 13056), (78, 13065), (81, 13071), (87, 13110),

Gene: Aesir\_20 Start: 11440, Stop: 11808, Start Num: 20

Candidate Starts for Aesir\_20:

(10, 11404), (Start: 20 @11440 has 34 MA's), (53, 11608), (57, 11635), (89, 11788),

Gene: Ajin\_22 Start: 11605, Stop: 11991, Start Num: 19

Candidate Starts for Ajin\_22:

(6, 11515), (Start: 19 @11605 has 47 MA's), (23, 11626), (47, 11755), (55, 11797), (62, 11830), (72, 11893), (77, 11914), (82, 11929), (83, 11941),

Gene: Alephilan\_17 Start: 13251, Stop: 13628, Start Num: 19

Candidate Starts for Alephilan\_17:

(Start: 19 @13251 has 47 MA's), (35, 13341), (60, 13455), (63, 13473), (69, 13503), (75, 13545),

Gene: Alyssamiracle\_18 Start: 11658, Stop: 12035, Start Num: 19

Candidate Starts for Alyssamiracle\_18:

(Start: 19 @11658 has 47 MA's), (22, 11673), (35, 11748), (37, 11757), (60, 11862), (63, 11880), (69, 11910), (75, 11952),

Gene: Anakin\_21 Start: 11650, Stop: 12018, Start Num: 20

Candidate Starts for Anakin\_21:

(10, 11614), (Start: 20 @11650 has 34 MA's), (53, 11818), (89, 11998),

Gene: AnnaSerena\_21 Start: 11659, Stop: 12027, Start Num: 20

Candidate Starts for AnnaSerena\_21:

(10, 11623), (Start: 20 @11659 has 34 MA's), (53, 11827), (89, 12007),

Gene: Annapurna\_20 Start: 10859, Stop: 11227, Start Num: 20

Candidate Starts for Annapurna\_20:

(10, 10823), (Start: 20 @10859 has 34 MA's), (53, 11027), (89, 11207),

Gene: Apeppi\_17 Start: 13373, Stop: 13750, Start Num: 19

Candidate Starts for Apeppi\_17:

(Start: 19 @13373 has 47 MA's), (22, 13388), (35, 13463), (42, 13496), (63, 13595), (69, 13625), (80, 13682),

Gene: Artiphact\_21 Start: 11651, Stop: 12019, Start Num: 20

Candidate Starts for Artiphact\_21:

(10, 11615), (Start: 20 @11651 has 34 MA's), (53, 11819), (89, 11999),

Gene: Astralis\_17 Start: 11658, Stop: 12035, Start Num: 19

Candidate Starts for Astralis\_17:

(Start: 19 @11658 has 47 MA's), (22, 11673), (35, 11748), (37, 11757), (60, 11862), (63, 11880), (69, 11910), (75, 11952),

Gene: Avian\_17 Start: 11658, Stop: 12035, Start Num: 19

Candidate Starts for Avian\_17:

(Start: 19 @11658 has 47 MA's), (22, 11673), (35, 11748), (37, 11757), (60, 11862), (63, 11880), (69, 11910), (75, 11952),

Gene: Barnyard\_24 Start: 14273, Stop: 14668, Start Num: 19

Candidate Starts for Barnyard\_24:

(Start: 19 @14273 has 47 MA's), (23, 14294), (29, 14342), (31, 14348), (68, 14528), (79, 14597),

Gene: Beckerton\_18 Start: 13163, Stop: 13546, Start Num: 16

Candidate Starts for Beckerton\_18:

(Start: 16 @13163 has 9 MA's), (25, 13202), (42, 13292), (45, 13310), (75, 13463),

Gene: Beyoncage\_14 Start: 9137, Stop: 9526, Start Num: 17

Candidate Starts for Beyoncage\_14:

(Start: 17 @9137 has 9 MA's), (27, 9182), (64, 9374), (78, 9455), (84, 9479),

Gene: BigMama\_17 Start: 12805, Stop: 13212, Start Num: 13

Candidate Starts for BigMama\_17:

(5, 12712), (Start: 13 @12805 has 27 MA's), (15, 12811), (Start: 21 @12835 has 1 MA's), (68, 13084), (76, 13132), (78, 13141), (81, 13147), (87, 13186),

Gene: BirthdayBoy\_20 Start: 14104, Stop: 14481, Start Num: 19

Candidate Starts for BirthdayBoy\_20:

(Start: 19 @14104 has 47 MA's), (22, 14119), (35, 14194), (37, 14203), (50, 14263), (60, 14308), (63, 14326), (69, 14356), (75, 14398),

Gene: BiteSize\_14 Start: 9137, Stop: 9526, Start Num: 17

Candidate Starts for BiteSize\_14:

(Start: 17 @9137 has 9 MA's), (27, 9182), (64, 9374), (78, 9455), (84, 9479),

Gene: BobtimousPrime\_17 Start: 13083, Stop: 13466, Start Num: 16

Candidate Starts for BobtimousPrime\_17:

(Start: 16 @13083 has 9 MA's), (42, 13212), (45, 13230), (75, 13383),

Gene: Bramble\_22 Start: 11570, Stop: 11956, Start Num: 19

Candidate Starts for Bramble\_22:

(6, 11480), (Start: 19 @11570 has 47 MA's), (23, 11591), (47, 11720), (55, 11762), (62, 11795), (72, 11858), (82, 11894), (83, 11906),

Gene: Butterscotch\_19 Start: 12789, Stop: 13196, Start Num: 13

Candidate Starts for Butterscotch\_19:

(Start: 13 @12789 has 27 MA's), (15, 12795), (Start: 21 @12819 has 1 MA's), (68, 13068), (76, 13116), (78, 13125), (81, 13131), (87, 13170),

Gene: Candle\_19 Start: 13157, Stop: 13534, Start Num: 14

Candidate Starts for Candle\_19:

(11, 13148), (Start: 14 @13157 has 9 MA's), (38, 13268), (73, 13439), (74, 13442), (76, 13451), (80, 13463), (86, 13499),

Gene: Cborch11\_19 Start: 12626, Stop: 13009, Start Num: 16

Candidate Starts for Cborch11\_19:

(Start: 16 @12626 has 9 MA's), (25, 12665), (42, 12755), (45, 12773), (75, 12926),

Gene: Charminar\_17 Start: 11658, Stop: 12035, Start Num: 19

Candidate Starts for Charminar\_17:

(Start: 19 @11658 has 47 MA's), (22, 11673), (35, 11748), (37, 11757), (60, 11862), (63, 11880), (69, 11910), (75, 11952),

Gene: Chill\_20 Start: 12795, Stop: 13202, Start Num: 13

Candidate Starts for Chill\_20:

(5, 12702), (Start: 13 @12795 has 27 MA's), (15, 12801), (Start: 21 @12825 has 1 MA's), (68, 13074), (76, 13122), (78, 13131), (81, 13137), (87, 13176),

Gene: Chivey\_20 Start: 10852, Stop: 11220, Start Num: 20

Candidate Starts for Chivey\_20:

(10, 10816), (Start: 20 @10852 has 34 MA's), (53, 11020), (89, 11200),

Gene: CoolCookie\_21 Start: 11657, Stop: 12025, Start Num: 20

Candidate Starts for CoolCookie\_21:

(10, 11621), (Start: 20 @11657 has 34 MA's), (53, 11825), (89, 12005),

Gene: Crestdrop\_20 Start: 10726, Stop: 11094, Start Num: 20

Candidate Starts for Crestdrop\_20:

(2, 10519), (10, 10690), (Start: 20 @10726 has 34 MA's), (53, 10894), (89, 11074),

Gene: Cuke\_12 Start: 8316, Stop: 8744, Start Num: 13

Candidate Starts for Cuke\_12:

(7, 8289), (Start: 13 @8316 has 27 MA's), (Start: 20 @8343 has 34 MA's), (22, 8352), (31, 8412), (33, 8415), (53, 8517), (58, 8550), (66, 8595), (69, 8616), (80, 8673),

Gene: Cybele\_21 Start: 11627, Stop: 11995, Start Num: 20

Candidate Starts for Cybele\_21:

(10, 11591), (Start: 20 @11627 has 34 MA's), (53, 11795), (89, 11975),

Gene: Damien\_18 Start: 12625, Stop: 13008, Start Num: 16

Candidate Starts for Damien\_18:

(Start: 16 @12625 has 9 MA's), (25, 12664), (42, 12754), (45, 12772), (75, 12925),

Gene: DannyDe\_20 Start: 10844, Stop: 11212, Start Num: 20

Candidate Starts for DannyDe\_20:

(10, 10808), (Start: 20 @10844 has 34 MA's), (53, 11012), (89, 11192),

Gene: Dauntless\_20 Start: 11369, Stop: 11737, Start Num: 20

Candidate Starts for Dauntless\_20:

(10, 11333), (Start: 20 @11369 has 34 MA's), (53, 11537), (89, 11717),

Gene: DaviePasture\_19 Start: 13861, Stop: 14238, Start Num: 19

Candidate Starts for DaviePasture\_19:

(Start: 19 @13861 has 47 MA's), (22, 13876), (35, 13951), (60, 14065), (63, 14083), (65, 14089), (69, 14113), (70, 14134), (75, 14155),

Gene: Delton\_19 Start: 12801, Stop: 13208, Start Num: 13

Candidate Starts for Delton\_19:

(5, 12708), (Start: 13 @12801 has 27 MA's), (15, 12807), (Start: 21 @12831 has 1 MA's), (68, 13080), (76, 13128), (78, 13137), (81, 13143), (87, 13182),

Gene: Demikore\_26 Start: 15829, Stop: 16200, Start Num: 13

Candidate Starts for Demikore\_26:

(Start: 13 @15829 has 27 MA's), (23, 15853), (30, 15904), (39, 15943), (43, 15958),

Gene: Djokovic\_14 Start: 9137, Stop: 9526, Start Num: 17

Candidate Starts for Djokovic\_14:

(Start: 17 @9137 has 9 MA's), (27, 9182), (64, 9374), (78, 9455), (84, 9479),

Gene: DoobyDoo\_18 Start: 13038, Stop: 13415, Start Num: 19

Candidate Starts for DoobyDoo\_18:

(Start: 19 @13038 has 47 MA's), (22, 13053), (35, 13128), (50, 13197), (60, 13242), (63, 13260), (69, 13290), (75, 13332),

Gene: DrLupo\_26 Start: 14684, Stop: 15067, Start Num: 19

Candidate Starts for DrLupo\_26:

(Start: 19 @14684 has 47 MA's), (23, 14705), (29, 14753), (31, 14759), (36, 14777), (79, 14996),

Gene: DumpTruck\_18 Start: 13292, Stop: 13672, Start Num: 19

Candidate Starts for DumpTruck\_18:

(Start: 19 @13292 has 47 MA's), (22, 13307), (35, 13382), (44, 13424), (56, 13484), (63, 13517),

Gene: Erk16\_19 Start: 12792, Stop: 13199, Start Num: 13

Candidate Starts for Erk16\_19:

(Start: 13 @12792 has 27 MA's), (15, 12798), (Start: 21 @12822 has 1 MA's), (68, 13071), (76, 13119), (78, 13128), (81, 13134), (87, 13173),

Gene: Erudite\_20 Start: 11369, Stop: 11737, Start Num: 20

Candidate Starts for Erudite\_20:

(10, 11333), (Start: 20 @11369 has 34 MA's), (53, 11537), (89, 11717),

Gene: Erutan\_19 Start: 13551, Stop: 13928, Start Num: 19

Candidate Starts for Erutan\_19:

(Start: 19 @13551 has 47 MA's), (22, 13566), (35, 13641), (37, 13650), (60, 13755), (63, 13773), (65, 13779), (69, 13803), (70, 13824), (75, 13845),

Gene: FountainFog\_20 Start: 10978, Stop: 11346, Start Num: 20

Candidate Starts for FountainFog\_20:

(10, 10942), (Start: 20 @10978 has 34 MA's), (48, 11125), (53, 11146), (89, 11326),

Gene: Fowlmouth\_13 Start: 8487, Stop: 8915, Start Num: 13

Candidate Starts for Fowlmouth\_13:

(7, 8460), (8, 8463), (Start: 13 @8487 has 27 MA's), (31, 8583), (66, 8766), (69, 8787),

Gene: FreddieHg\_20 Start: 10868, Stop: 11236, Start Num: 20

Candidate Starts for FreddieHg\_20:

(10, 10832), (Start: 20 @10868 has 34 MA's), (53, 11036), (89, 11216),

Gene: Fulcrum\_20 Start: 14084, Stop: 14461, Start Num: 19

Candidate Starts for Fulcrum\_20:

(Start: 19 @14084 has 47 MA's), (22, 14099), (35, 14174), (37, 14183), (50, 14243), (60, 14288), (63, 14306), (69, 14336), (75, 14378),

Gene: GOATification\_20 Start: 14084, Stop: 14461, Start Num: 19

Candidate Starts for GOATification\_20:

(Start: 19 @14084 has 47 MA's), (22, 14099), (35, 14174), (37, 14183), (50, 14243), (60, 14288), (63, 14306), (69, 14336), (75, 14378),

Gene: Genamy16\_18 Start: 11658, Stop: 12035, Start Num: 19

Candidate Starts for Genamy16\_18:

(Start: 19 @11658 has 47 MA's), (22, 11673), (35, 11748), (37, 11757), (60, 11862), (63, 11880), (69, 11910), (75, 11952),

Gene: Gibbin\_20 Start: 14144, Stop: 14521, Start Num: 19

Candidate Starts for Gibbin\_20:

(Start: 19 @14144 has 47 MA's), (22, 14159), (35, 14234), (37, 14243), (50, 14303), (60, 14348), (63, 14366), (69, 14396), (75, 14438),

Gene: Gilda\_21 Start: 11651, Stop: 12019, Start Num: 20

Candidate Starts for Gilda\_21:

(10, 11615), (Start: 20 @11651 has 34 MA's), (53, 11819), (89, 11999),

Gene: Giuseppe\_19 Start: 12781, Stop: 13188, Start Num: 13

Candidate Starts for Giuseppe\_19:

(Start: 13 @12781 has 27 MA's), (15, 12787), (Start: 21 @12811 has 1 MA's), (68, 13060), (76, 13108), (78, 13117), (81, 13123), (87, 13162),

Gene: Gretellyn\_19 Start: 14418, Stop: 14795, Start Num: 19

Candidate Starts for Gretellyn\_19:

(Start: 19 @14418 has 47 MA's), (22, 14433), (35, 14508), (37, 14517), (50, 14577), (60, 14622), (63, 14640), (69, 14670), (75, 14712),

Gene: Gumball\_18 Start: 12739, Stop: 13146, Start Num: 13

Candidate Starts for Gumball\_18:

(Start: 13 @12739 has 27 MA's), (15, 12745), (Start: 21 @12769 has 1 MA's), (68, 13018), (76, 13066), (78, 13075), (81, 13081), (87, 13120),

Gene: Hager\_22 Start: 11222, Stop: 11590, Start Num: 20

Candidate Starts for Hager\_22:

(1, 10970), (10, 11186), (Start: 20 @11222 has 34 MA's), (53, 11390), (89, 11570),

Gene: Haunter\_21 Start: 11064, Stop: 11432, Start Num: 20

Candidate Starts for Haunter\_21:

(10, 11028), (Start: 20 @11064 has 34 MA's), (53, 11232), (89, 11412),

Gene: Hawkeye\_21 Start: 12664, Stop: 13071, Start Num: 13

Candidate Starts for Hawkeye\_21:

(Start: 13 @12664 has 27 MA's), (15, 12670), (29, 12754), (34, 12772), (36, 12778), (85, 13036),

Gene: Helpful\_20 Start: 12789, Stop: 13196, Start Num: 13

Candidate Starts for Helpful\_20:

(Start: 13 @12789 has 27 MA's), (15, 12795), (Start: 21 @12819 has 1 MA's), (68, 13068), (76, 13116), (78, 13125), (81, 13131), (87, 13170),

Gene: Hiddenleaf\_20 Start: 10852, Stop: 11220, Start Num: 20

Candidate Starts for Hiddenleaf\_20:

(10, 10816), (Start: 20 @10852 has 34 MA's), (53, 11020), (89, 11200),

Gene: Huwbert\_42 Start: 21947, Stop: 22348, Start Num: 18  
Candidate Starts for Huwbert\_42:  
(3, 21812), (Start: 18 @21947 has 3 MA's), (23, 21971), (26, 21986), (28, 22013), (34, 22046), (48, 22115), (88, 22319),

Gene: Indlulamithi\_16 Start: 10589, Stop: 11005, Start Num: 12  
Candidate Starts for Indlulamithi\_16:  
(9, 10574), (Start: 12 @10589 has 1 MA's), (29, 10664), (41, 10718), (42, 10721), (49, 10754), (69, 10877),

Gene: JDawG\_20 Start: 11434, Stop: 11802, Start Num: 20  
Candidate Starts for JDawG\_20:  
(10, 11398), (Start: 20 @11434 has 34 MA's), (53, 11602), (89, 11782),

Gene: Jalebi\_19 Start: 14594, Stop: 14971, Start Num: 19  
Candidate Starts for Jalebi\_19:  
(Start: 19 @14594 has 47 MA's), (22, 14609), (35, 14684), (37, 14693), (50, 14753), (60, 14798), (63, 14816), (69, 14846), (75, 14888),

Gene: Jamemuya19\_17 Start: 11658, Stop: 12035, Start Num: 19  
Candidate Starts for Jamemuya19\_17:  
(Start: 19 @11658 has 47 MA's), (22, 11673), (35, 11748), (37, 11757), (60, 11862), (63, 11880), (69, 11910), (75, 11952),

Gene: JingleBells\_20 Start: 10933, Stop: 11301, Start Num: 20  
Candidate Starts for JingleBells\_20:  
(10, 10897), (Start: 20 @10933 has 34 MA's), (53, 11101), (89, 11281),

Gene: KandZ\_19 Start: 12889, Stop: 13296, Start Num: 13  
Candidate Starts for KandZ\_19:  
(Start: 13 @12889 has 27 MA's), (15, 12895), (Start: 21 @12919 has 1 MA's), (68, 13168), (76, 13216), (78, 13225), (81, 13231), (87, 13270),

Gene: Karate\_20 Start: 11072, Stop: 11440, Start Num: 20  
Candidate Starts for Karate\_20:  
(10, 11036), (Start: 20 @11072 has 34 MA's), (53, 11240), (89, 11420),

Gene: Kate\_21 Start: 11659, Stop: 12027, Start Num: 20  
Candidate Starts for Kate\_21:  
(10, 11623), (Start: 20 @11659 has 34 MA's), (53, 11827), (89, 12007),

Gene: Konstantine\_23 Start: 13827, Stop: 14210, Start Num: 16  
Candidate Starts for Konstantine\_23:  
(Start: 16 @13827 has 9 MA's), (25, 13866), (42, 13956), (45, 13974), (75, 14127),

Gene: Kors\_22 Start: 11651, Stop: 12037, Start Num: 19  
Candidate Starts for Kors\_22:  
(6, 11561), (Start: 19 @11651 has 47 MA's), (23, 11672), (47, 11801), (55, 11843), (62, 11876), (72, 11939), (82, 11975), (83, 11987),

Gene: Krampus\_21 Start: 11657, Stop: 12025, Start Num: 20  
Candidate Starts for Krampus\_21:  
(10, 11621), (Start: 20 @11657 has 34 MA's), (53, 11825), (89, 12005),

Gene: Labelle\_25 Start: 15831, Stop: 16202, Start Num: 13

Candidate Starts for Labelle\_25:

(Start: 13 @15831 has 27 MA's), (23, 15855), (30, 15906), (39, 15945), (43, 15960),

Gene: Lambo\_19 Start: 14088, Stop: 14465, Start Num: 19

Candidate Starts for Lambo\_19:

(Start: 19 @14088 has 47 MA's), (22, 14103), (35, 14178), (37, 14187), (60, 14292), (63, 14310), (65, 14316), (69, 14340), (70, 14361), (75, 14382),

Gene: LavAbarElk\_17 Start: 12521, Stop: 12898, Start Num: 19

Candidate Starts for LavAbarElk\_17:

(Start: 19 @12521 has 47 MA's), (22, 12536), (35, 12611), (37, 12620), (50, 12680), (60, 12725), (63, 12743), (69, 12773), (75, 12815),

Gene: Lila22\_19 Start: 14042, Stop: 14419, Start Num: 19

Candidate Starts for Lila22\_19:

(Start: 19 @14042 has 47 MA's), (22, 14057), (35, 14132), (37, 14141), (50, 14201), (60, 14246), (63, 14264), (69, 14294), (75, 14336),

Gene: LilyPad\_15 Start: 9856, Stop: 10245, Start Num: 17

Candidate Starts for LilyPad\_15:

(Start: 17 @9856 has 9 MA's), (27, 9901), (30, 9931), (31, 9934), (32, 9937), (64, 10093),

Gene: LittleFella\_16 Start: 11757, Stop: 12137, Start Num: 17

Candidate Starts for LittleFella\_16:

(Start: 17 @11757 has 9 MA's), (46, 11907), (64, 11985), (66, 11991), (76, 12057),

Gene: LordBart\_22 Start: 11567, Stop: 11953, Start Num: 19

Candidate Starts for LordBart\_22:

(6, 11477), (Start: 19 @11567 has 47 MA's), (23, 11588), (47, 11717), (55, 11759), (62, 11792), (69, 11828), (71, 11852), (72, 11855), (77, 11876), (82, 11891), (83, 11903),

Gene: LuckyLeo\_18 Start: 13373, Stop: 13750, Start Num: 19

Candidate Starts for LuckyLeo\_18:

(Start: 19 @13373 has 47 MA's), (22, 13388), (35, 13463), (42, 13496), (63, 13595), (69, 13625), (80, 13682),

Gene: Madi\_14 Start: 9137, Stop: 9526, Start Num: 17

Candidate Starts for Madi\_14:

(Start: 17 @9137 has 9 MA's), (27, 9182), (64, 9374), (78, 9455), (84, 9479),

Gene: Madruga\_24 Start: 15500, Stop: 15871, Start Num: 13

Candidate Starts for Madruga\_24:

(Start: 13 @15500 has 27 MA's), (23, 15524), (30, 15575), (39, 15614), (43, 15629),

Gene: Megatron06\_20 Start: 13160, Stop: 13543, Start Num: 16

Candidate Starts for Megatron06\_20:

(Start: 16 @13160 has 9 MA's), (42, 13289), (45, 13307), (75, 13460),

Gene: Mima20\_18 Start: 13771, Stop: 14148, Start Num: 19

Candidate Starts for Mima20\_18:

(Start: 19 @13771 has 47 MA's), (22, 13786), (35, 13861), (37, 13870), (60, 13975), (63, 13993), (65, 13999), (69, 14023), (70, 14044), (75, 14065),

Gene: MoiGyank\_21 Start: 14455, Stop: 14832, Start Num: 19

Candidate Starts for MoiGyank\_21:

(Start: 19 @14455 has 47 MA's), (22, 14470), (35, 14545), (37, 14554), (50, 14614), (60, 14659), (63, 14677), (69, 14707), (75, 14749),

Gene: MontyDev\_19 Start: 12815, Stop: 13192, Start Num: 14

Candidate Starts for MontyDev\_19:

(11, 12806), (Start: 14 @12815 has 9 MA's), (38, 12926), (73, 13097), (74, 13100), (76, 13109), (80, 13121), (86, 13157),

Gene: Mopey\_19 Start: 12789, Stop: 13196, Start Num: 13

Candidate Starts for Mopey\_19:

(Start: 13 @12789 has 27 MA's), (15, 12795), (Start: 21 @12819 has 1 MA's), (68, 13068), (76, 13116), (78, 13125), (81, 13131), (87, 13170),

Gene: MortySmith\_19 Start: 10831, Stop: 11199, Start Num: 20

Candidate Starts for MortySmith\_19:

(10, 10795), (Start: 20 @10831 has 34 MA's), (53, 10999), (89, 11179),

Gene: MrMiyagi\_13 Start: 8487, Stop: 8915, Start Num: 13

Candidate Starts for MrMiyagi\_13:

(7, 8460), (8, 8463), (Start: 13 @8487 has 27 MA's), (31, 8583), (38, 8619), (66, 8766), (69, 8787), (74, 8823),

Gene: NarutoRun\_21 Start: 11650, Stop: 12018, Start Num: 20

Candidate Starts for NarutoRun\_21:

(10, 11614), (Start: 20 @11650 has 34 MA's), (53, 11818), (89, 11998),

Gene: Neptune\_21 Start: 11627, Stop: 11995, Start Num: 20

Candidate Starts for Neptune\_21:

(10, 11591), (Start: 20 @11627 has 34 MA's), (53, 11795), (89, 11975),

Gene: Nilo\_20 Start: 13154, Stop: 13531, Start Num: 14

Candidate Starts for Nilo\_20:

(11, 13145), (Start: 14 @13154 has 9 MA's), (38, 13265), (73, 13436), (74, 13439), (76, 13448), (80, 13460), (86, 13496),

Gene: NorManre\_20 Start: 13650, Stop: 14027, Start Num: 19

Candidate Starts for NorManre\_20:

(Start: 19 @13650 has 47 MA's), (22, 13665), (35, 13740), (37, 13749), (60, 13854), (63, 13872), (65, 13878), (69, 13902), (70, 13923), (75, 13944), (88, 14007),

Gene: Nova\_19 Start: 13216, Stop: 13623, Start Num: 13

Candidate Starts for Nova\_19:

(Start: 13 @13216 has 27 MA's), (15, 13222), (Start: 21 @13246 has 1 MA's), (68, 13495), (76, 13543), (78, 13552), (81, 13558), (87, 13597),

Gene: NovaSharks\_18 Start: 11658, Stop: 12035, Start Num: 19

Candidate Starts for NovaSharks\_18:

(Start: 19 @11658 has 47 MA's), (22, 11673), (35, 11748), (37, 11757), (60, 11862), (63, 11880), (69, 11910), (75, 11952),

Gene: Oaker\_18 Start: 12884, Stop: 13267, Start Num: 16

Candidate Starts for Oaker\_18:

(Start: 16 @12884 has 9 MA's), (25, 12923), (42, 13013), (45, 13031), (75, 13184),

Gene: OhDear\_21 Start: 11656, Stop: 12024, Start Num: 20

Candidate Starts for OhDear\_21:

(10, 11620), (Start: 20 @11656 has 34 MA's), (53, 11824), (89, 12004),

Gene: OtterstedtS21\_19 Start: 13740, Stop: 14117, Start Num: 19

Candidate Starts for OtterstedtS21\_19:

(Start: 19 @13740 has 47 MA's), (22, 13755), (35, 13830), (37, 13839), (50, 13899), (60, 13944), (63, 13962), (69, 13992), (75, 14034),

Gene: OverHedge\_21 Start: 11624, Stop: 11992, Start Num: 20

Candidate Starts for OverHedge\_21:

(10, 11588), (Start: 20 @11624 has 34 MA's), (53, 11792), (89, 11972),

Gene: PBI1\_20 Start: 12720, Stop: 13127, Start Num: 13

Candidate Starts for PBI1\_20:

(Start: 13 @12720 has 27 MA's), (15, 12726), (Start: 21 @12750 has 1 MA's), (68, 12999), (76, 13047), (78, 13056), (81, 13062), (87, 13101),

Gene: PLOT\_20 Start: 12792, Stop: 13199, Start Num: 13

Candidate Starts for PLOT\_20:

(Start: 13 @12792 has 27 MA's), (15, 12798), (Start: 21 @12822 has 1 MA's), (68, 13071), (76, 13119), (78, 13128), (81, 13134), (87, 13173),

Gene: Papyrus\_19 Start: 12816, Stop: 13193, Start Num: 14

Candidate Starts for Papyrus\_19:

(11, 12807), (Start: 14 @12816 has 9 MA's), (38, 12927), (73, 13098), (74, 13101), (76, 13110), (80, 13122), (86, 13158),

Gene: ParvusTarda\_19 Start: 13222, Stop: 13599, Start Num: 19

Candidate Starts for ParvusTarda\_19:

(Start: 19 @13222 has 47 MA's), (22, 13237), (35, 13312), (37, 13321), (60, 13426), (63, 13444), (65, 13450), (69, 13474), (70, 13495), (75, 13516),

Gene: Patience\_26 Start: 16390, Stop: 16761, Start Num: 13

Candidate Starts for Patience\_26:

(Start: 13 @16390 has 27 MA's), (23, 16414), (30, 16465), (39, 16504), (43, 16519),

Gene: Patos\_20 Start: 13650, Stop: 14027, Start Num: 19

Candidate Starts for Patos\_20:

(Start: 19 @13650 has 47 MA's), (22, 13665), (35, 13740), (37, 13749), (60, 13854), (63, 13872), (65, 13878), (69, 13902), (70, 13923), (75, 13944), (88, 14007),

Gene: Penelope2018\_19 Start: 12789, Stop: 13196, Start Num: 13

Candidate Starts for Penelope2018\_19:

(Start: 13 @12789 has 27 MA's), (15, 12795), (Start: 21 @12819 has 1 MA's), (68, 13068), (76, 13116), (78, 13125), (81, 13131), (87, 13170),

Gene: Phalaborwa\_19 Start: 12852, Stop: 13229, Start Num: 21

Candidate Starts for Phalaborwa\_19:

(5, 12729), (Start: 13 @12822 has 27 MA's), (15, 12828), (Start: 21 @12852 has 1 MA's), (61, 13065), (68, 13101), (76, 13149), (78, 13158), (81, 13164), (85, 13194), (87, 13203),

Gene: Pharpay\_21 Start: 11672, Stop: 12040, Start Num: 20

Candidate Starts for Pharpay\_21:

(10, 11636), (Start: 20 @11672 has 34 MA's), (53, 11840), (89, 12020),

Gene: Phreeze\_18 Start: 12625, Stop: 13008, Start Num: 16

Candidate Starts for Phreeze\_18:

(Start: 16 @12625 has 9 MA's), (25, 12664), (42, 12754), (45, 12772), (75, 12925),

Gene: PhunaPhoke\_21 Start: 11645, Stop: 12013, Start Num: 20

Candidate Starts for PhunaPhoke\_21:

(10, 11609), (Start: 20 @11645 has 34 MA's), (53, 11813), (89, 11993),

Gene: Potty\_21 Start: 11650, Stop: 12018, Start Num: 20

Candidate Starts for Potty\_21:

(10, 11614), (Start: 20 @11650 has 34 MA's), (53, 11818), (89, 11998),

Gene: Poultruss\_20 Start: 11423, Stop: 11791, Start Num: 20

Candidate Starts for Poultruss\_20:

(10, 11387), (Start: 20 @11423 has 34 MA's), (53, 11591), (89, 11771),

Gene: Prager\_19 Start: 12801, Stop: 13208, Start Num: 13

Candidate Starts for Prager\_19:

(5, 12708), (Start: 13 @12801 has 27 MA's), (15, 12807), (Start: 21 @12831 has 1 MA's), (68, 13080), (76, 13128), (78, 13137), (81, 13143), (87, 13182),

Gene: Predator\_22 Start: 14150, Stop: 14533, Start Num: 16

Candidate Starts for Predator\_22:

(Start: 16 @14150 has 9 MA's), (25, 14189), (40, 14276), (50, 14315), (65, 14384), (75, 14450),

Gene: Puissant\_17 Start: 13081, Stop: 13464, Start Num: 16

Candidate Starts for Puissant\_17:

(Start: 16 @13081 has 9 MA's), (25, 13120), (44, 13219), (50, 13246), (75, 13381),

Gene: Rachella\_21 Start: 11653, Stop: 12021, Start Num: 20

Candidate Starts for Rachella\_21:

(10, 11617), (Start: 20 @11653 has 34 MA's), (53, 11821), (89, 12001),

Gene: Ranch\_19 Start: 12588, Stop: 12965, Start Num: 19

Candidate Starts for Ranch\_19:

(Start: 19 @12588 has 47 MA's), (22, 12603), (35, 12678), (37, 12687), (60, 12792), (63, 12810), (65, 12816), (67, 12825), (69, 12840), (75, 12882),

Gene: RazorC\_17 Start: 11658, Stop: 12035, Start Num: 19

Candidate Starts for RazorC\_17:

(Start: 19 @11658 has 47 MA's), (22, 11673), (35, 11748), (37, 11757), (60, 11862), (63, 11880), (69, 11910), (75, 11952),

Gene: Rie18\_21 Start: 11004, Stop: 11372, Start Num: 20  
Candidate Starts for Rie18\_21:  
(10, 10968), (Start: 20 @11004 has 34 MA's), (53, 11172), (89, 11352),

Gene: RikSengupta\_22 Start: 11688, Stop: 12074, Start Num: 19  
Candidate Starts for RikSengupta\_22:  
(6, 11598), (Start: 19 @11688 has 47 MA's), (23, 11709), (47, 11838), (55, 11880), (62, 11913), (72, 11976), (82, 12012), (83, 12024),

Gene: Riparian\_19 Start: 12615, Stop: 12992, Start Num: 14  
Candidate Starts for Riparian\_19:  
(11, 12606), (Start: 14 @12615 has 9 MA's), (38, 12726), (73, 12897), (74, 12900), (76, 12909), (80, 12921), (86, 12957),

Gene: Rope\_19 Start: 12807, Stop: 13184, Start Num: 14  
Candidate Starts for Rope\_19:  
(11, 12798), (Start: 14 @12807 has 9 MA's), (38, 12918), (73, 13089), (74, 13092), (76, 13101), (80, 13113), (86, 13149),

Gene: Rota\_18 Start: 13546, Stop: 13923, Start Num: 19  
Candidate Starts for Rota\_18:  
(Start: 19 @13546 has 47 MA's), (22, 13561), (35, 13636), (37, 13645), (50, 13705), (60, 13750), (63, 13768), (69, 13798), (75, 13840),

Gene: Rukungu\_19 Start: 14287, Stop: 14664, Start Num: 19  
Candidate Starts for Rukungu\_19:  
(Start: 19 @14287 has 47 MA's), (22, 14302), (35, 14377), (37, 14386), (50, 14446), (60, 14491), (63, 14509), (69, 14539), (75, 14581),

Gene: Rumi\_18 Start: 11658, Stop: 12035, Start Num: 19  
Candidate Starts for Rumi\_18:  
(Start: 19 @11658 has 47 MA's), (22, 11673), (35, 11748), (37, 11757), (60, 11862), (63, 11880), (69, 11910), (75, 11952),

Gene: Sadboi\_19 Start: 14418, Stop: 14795, Start Num: 19  
Candidate Starts for Sadboi\_19:  
(Start: 19 @14418 has 47 MA's), (22, 14433), (35, 14508), (37, 14517), (50, 14577), (60, 14622), (63, 14640), (69, 14670), (75, 14712),

Gene: Sampudon\_19 Start: 14594, Stop: 14971, Start Num: 19  
Candidate Starts for Sampudon\_19:  
(Start: 19 @14594 has 47 MA's), (22, 14609), (35, 14684), (37, 14693), (50, 14753), (60, 14798), (63, 14816), (69, 14846), (75, 14888),

Gene: Send513\_19 Start: 13157, Stop: 13534, Start Num: 14  
Candidate Starts for Send513\_19:  
(11, 13148), (Start: 14 @13157 has 9 MA's), (38, 13268), (73, 13439), (74, 13442), (76, 13451), (80, 13463), (86, 13499),

Gene: Shrew\_54 Start: 26408, Stop: 26803, Start Num: 19  
Candidate Starts for Shrew\_54:  
(Start: 19 @26408 has 47 MA's), (23, 26429), (34, 26504), (38, 26528), (52, 26588), (64, 26651), (67, 26663), (78, 26723),

Gene: Sienna\_14 Start: 9137, Stop: 9526, Start Num: 17  
Candidate Starts for Sienna\_14:  
(Start: 17 @9137 has 9 MA's), (27, 9182), (64, 9374), (78, 9455), (84, 9479),

Gene: SilentWarrior\_20 Start: 10860, Stop: 11228, Start Num: 20  
Candidate Starts for SilentWarrior\_20:  
(10, 10824), (Start: 20 @10860 has 34 MA's), (53, 11028), (89, 11208),

Gene: SirHarley\_18 Start: 12751, Stop: 13128, Start Num: 21  
Candidate Starts for SirHarley\_18:  
(Start: 13 @12721 has 27 MA's), (15, 12727), (Start: 21 @12751 has 1 MA's), (68, 13000), (76, 13048),  
(78, 13057), (81, 13063), (87, 13102),

Gene: Snakehole\_22 Start: 10949, Stop: 11317, Start Num: 20  
Candidate Starts for Snakehole\_22:  
(10, 10913), (Start: 20 @10949 has 34 MA's), (53, 11117), (89, 11297),

Gene: Sparcetus\_22 Start: 11567, Stop: 11953, Start Num: 19  
Candidate Starts for Sparcetus\_22:  
(6, 11477), (Start: 19 @11567 has 47 MA's), (23, 11588), (47, 11717), (55, 11759), (62, 11792), (72,  
11855), (82, 11891), (83, 11903),

Gene: Stormer\_17 Start: 11658, Stop: 12035, Start Num: 19  
Candidate Starts for Stormer\_17:  
(Start: 19 @11658 has 47 MA's), (22, 11673), (35, 11748), (37, 11757), (60, 11862), (63, 11880), (69,  
11910), (75, 11952),

Gene: SuperSonics\_25 Start: 15632, Stop: 15928, Start Num: 30  
Candidate Starts for SuperSonics\_25:  
(Start: 13 @15557 has 27 MA's), (23, 15581), (30, 15632), (39, 15671), (43, 15686),

Gene: SuperheroCarly\_20 Start: 12651, Stop: 13058, Start Num: 13  
Candidate Starts for SuperheroCarly\_20:  
(Start: 13 @12651 has 27 MA's), (15, 12657), (Start: 21 @12681 has 1 MA's), (68, 12930), (76, 12978),  
(78, 12987), (81, 12993), (87, 13032),

Gene: Suzy\_15 Start: 10365, Stop: 10754, Start Num: 17  
Candidate Starts for Suzy\_15:  
(Start: 17 @10365 has 9 MA's), (22, 10383), (27, 10410), (64, 10602), (66, 10608), (78, 10683), (84,  
10707),

Gene: Tedro\_21 Start: 11123, Stop: 11491, Start Num: 20  
Candidate Starts for Tedro\_21:  
(10, 11087), (Start: 20 @11123 has 34 MA's), (53, 11291), (89, 11471),

Gene: Terapin\_14 Start: 9137, Stop: 9526, Start Num: 17  
Candidate Starts for Terapin\_14:  
(Start: 17 @9137 has 9 MA's), (27, 9182), (64, 9374), (78, 9455), (84, 9479),

Gene: Thoth\_19 Start: 12786, Stop: 13193, Start Num: 13  
Candidate Starts for Thoth\_19:

(Start: 13 @12786 has 27 MA's), (15, 12792), (Start: 21 @12816 has 1 MA's), (68, 13065), (76, 13113), (78, 13122), (81, 13128), (87, 13167),

Gene: Thumb\_18 Start: 12626, Stop: 13009, Start Num: 16  
Candidate Starts for Thumb\_18:  
(Start: 16 @12626 has 9 MA's), (42, 12755), (45, 12773), (75, 12926),

Gene: Tillicus\_19 Start: 12967, Stop: 13344, Start Num: 19  
Candidate Starts for Tillicus\_19:  
(Start: 19 @12967 has 47 MA's), (22, 12982), (35, 13057), (42, 13090), (63, 13189), (69, 13219),

Gene: TinyMiny\_22 Start: 11586, Stop: 11972, Start Num: 19  
Candidate Starts for TinyMiny\_22:  
(6, 11496), (Start: 19 @11586 has 47 MA's), (23, 11607), (47, 11736), (55, 11778), (62, 11811), (72, 11874), (82, 11910), (83, 11922),

Gene: Tongui\_20 Start: 10996, Stop: 11364, Start Num: 20  
Candidate Starts for Tongui\_20:  
(10, 10960), (Start: 20 @10996 has 34 MA's), (53, 11164), (89, 11344),

Gene: Triscuit\_41 Start: 21862, Stop: 22263, Start Num: 18  
Candidate Starts for Triscuit\_41:  
(4, 21730), (Start: 18 @21862 has 3 MA's), (23, 21886), (26, 21901), (28, 21928), (31, 21940), (34, 21961), (48, 22030), (88, 22234),

Gene: Troll4\_19 Start: 12790, Stop: 13197, Start Num: 13  
Candidate Starts for Troll4\_19:  
(Start: 13 @12790 has 27 MA's), (15, 12796), (Start: 21 @12820 has 1 MA's), (68, 13069), (76, 13117), (78, 13126), (81, 13132), (87, 13171),

Gene: Visconti\_19 Start: 12799, Stop: 13206, Start Num: 13  
Candidate Starts for Visconti\_19:  
(Start: 13 @12799 has 27 MA's), (15, 12805), (Start: 21 @12829 has 1 MA's), (68, 13078), (76, 13126), (78, 13135), (81, 13141), (87, 13180),

Gene: WaldoWhy\_20 Start: 12795, Stop: 13202, Start Num: 13  
Candidate Starts for WaldoWhy\_20:  
(5, 12702), (Start: 13 @12795 has 27 MA's), (15, 12801), (Start: 21 @12825 has 1 MA's), (68, 13074), (76, 13122), (78, 13131), (81, 13137), (87, 13176),

Gene: Weiss13\_19 Start: 12847, Stop: 13224, Start Num: 14  
Candidate Starts for Weiss13\_19:  
(11, 12838), (Start: 14 @12847 has 9 MA's), (38, 12958), (73, 13129), (74, 13132), (76, 13141), (80, 13153), (86, 13189),

Gene: Wojtek\_18 Start: 13295, Stop: 13672, Start Num: 19  
Candidate Starts for Wojtek\_18:  
(Start: 19 @13295 has 47 MA's), (22, 13310), (35, 13385), (37, 13394), (50, 13454), (60, 13499), (63, 13517), (69, 13547), (75, 13589),

Gene: Wollypog\_9 Start: 8239, Stop: 8610, Start Num: 18  
Candidate Starts for Wollypog\_9:

(Start: 18 @8239 has 3 MA's), (23, 8263), (24, 8269), (51, 8398), (54, 8425), (59, 8440), (63, 8470), (64, 8473), (66, 8479), (78, 8545), (90, 8596),

Gene: Xenia2\_19 Start: 13334, Stop: 13714, Start Num: 19

Candidate Starts for Xenia2\_19:

(Start: 19 @13334 has 47 MA's), (22, 13349), (35, 13424), (44, 13466), (56, 13526), (63, 13559),

Gene: Yelo\_19 Start: 13157, Stop: 13534, Start Num: 14

Candidate Starts for Yelo\_19:

(11, 13148), (Start: 14 @13157 has 9 MA's), (Start: 16 @13169 has 9 MA's), (33, 13235), (38, 13268), (73, 13439), (74, 13442), (76, 13451), (80, 13463), (86, 13499),

Gene: Yikes\_20 Start: 14679, Stop: 15056, Start Num: 19

Candidate Starts for Yikes\_20:

(Start: 19 @14679 has 47 MA's), (22, 14694), (35, 14769), (37, 14778), (60, 14883), (63, 14901), (65, 14907), (69, 14931), (70, 14952), (75, 14973),

Gene: Zany\_18 Start: 13808, Stop: 14185, Start Num: 19

Candidate Starts for Zany\_18:

(Start: 19 @13808 has 47 MA's), (22, 13823), (35, 13898), (37, 13907), (60, 14012), (63, 14030), (69, 14060), (75, 14102),

Gene: Zenon\_20 Start: 13159, Stop: 13536, Start Num: 14

Candidate Starts for Zenon\_20:

(11, 13150), (Start: 14 @13159 has 9 MA's), (38, 13270), (73, 13441), (74, 13444), (76, 13453), (80, 13465), (86, 13501),