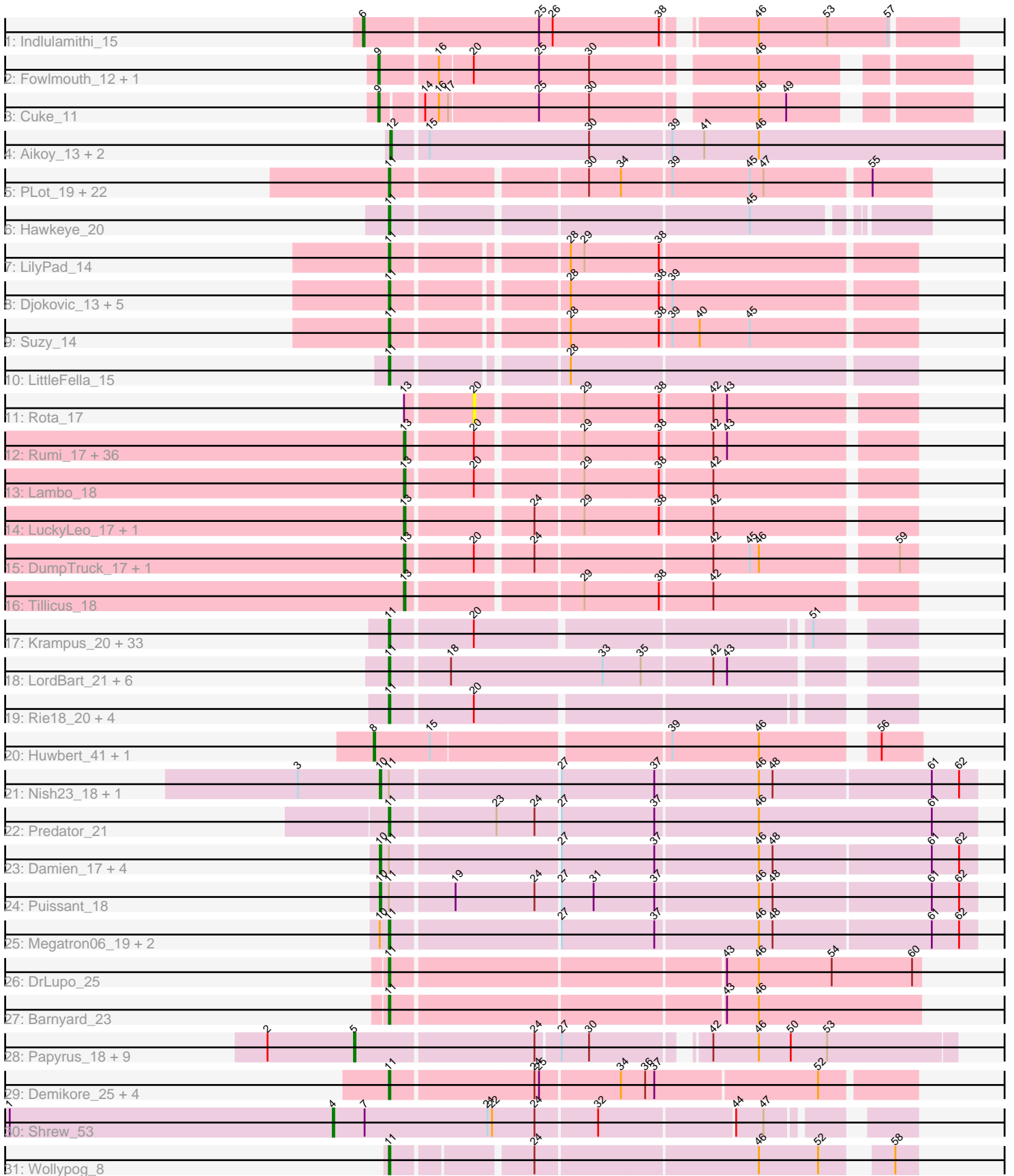


Pham 311298



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 311298 Report

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

Pham number 311298 has 163 members, 13 are drafts.

Phages represented in each track:

- Track 1 : Indlulamithi\_15
- Track 2 : Fowlmouth\_12, MrMiyagi\_12
- Track 3 : Cuke\_11
- Track 4 : Aikoy\_13, Onyinye\_14, Leopard\_13
- Track 5 : PLOT\_19, Mopey\_18, WaldoWhy\_19, Visconti\_18, Gumball\_17, KandZ\_18, Helpful\_19, Delton\_18, SirHarley\_17, Thoth\_18, Adjutor\_19, BigMama\_16, Chill\_19, Prager\_18, Penelope2018\_18, SuperheroCarly\_18, Troll4\_18, Erk16\_18, Giuseppe\_18, PBI1\_19, Phalaborwa\_18, Nova\_18, Butterscotch\_18
- Track 6 : Hawkeye\_20
- Track 7 : LilyPad\_14
- Track 8 : Djokovic\_13, Terapin\_13, BiteSize\_13, Beyoncage\_13, Madi\_13, Sienna\_13
- Track 9 : Suzy\_14
- Track 10 : LittleFella\_15
- Track 11 : Rota\_17
- Track 12 : Rumi\_17, Astralis\_16, OtterstedtS21\_18, Fulcrum\_19, Charminar\_16, Ranch\_18, Alyssamiracle\_17, Stormer\_16, Gibbin\_19, Lila22\_18, Genamy16\_17, Mima20\_17, Sampudon\_18, ParvusTarda\_18, Patos\_19, DaviePasture\_18, DoobyDoo\_17, GretelLyn\_18, MoiGyank\_20, Riduram\_16, Avian\_16, Sadboi\_18, LavAbarElk\_16, Jalebi\_18, Alephilan\_16, Zany\_17, Wojtek\_17, Pywacket\_17, BirthdayBoy\_19, NovaSharks\_17, Jamemuya19\_16, Yikes\_19, NorManre\_19, RazorC\_16, GOATification\_19, Rukungu\_18, Erutan\_18
- Track 13 : Lambo\_18
- Track 14 : LuckyLeo\_17, Apeppi\_16
- Track 15 : DumpTruck\_17, Xenia2\_18
- Track 16 : Tillicus\_18
- Track 17 : Krampus\_20, SilentWarrior\_19, Neptune\_20, Snakehole\_21, CoolCookie\_20, Dauntless\_19, Chivey\_19, Pharpay\_20, Gilda\_20, Anakin\_20, Rachella\_20, Erudite\_19, FreddieHg\_19, Haunter\_20, Aesir\_19, Kate\_20, DannyDe\_19, Annapurna\_19, OhDear\_20, Potty\_20, Artiphact\_20, AnnaSerena\_20, Tedro\_20, MortySmith\_18, PhunaPhoke\_20, Cybele\_20, JDawG\_19, OverHedge\_20, NarutoRun\_20, JingleBells\_19, Crestdrop\_19, Hiddenleaf\_19, Poultruss\_19, Tiggy93\_20
- Track 18 : LordBart\_21, Ajin\_21, RikSengupta\_21, Kors\_21, Bramble\_21, TinyMiny\_21, Sparcetus\_21
- Track 19 : Rie18\_20, Hager\_21, Tongui\_19, Karate\_19, FountainFog\_19
- Track 20 : Huwbert\_41, Triscuit\_40

- Track 21 : Nish23\_18, Cborch11\_18
- Track 22 : Predator\_21
- Track 23 : Damien\_17, Phreeze\_17, Beckerton\_17, Konstantine\_22, BobtimousPrime\_19
- Track 24 : Puissant\_18
- Track 25 : Megatron06\_19, Thumb\_17, Oaker\_17
- Track 26 : DrLupo\_25
- Track 27 : Barnyard\_23
- Track 28 : Papyrus\_18, MontyDev\_18, Nilo\_19, Candle\_18, Weiss13\_18, Riparian\_18, Send513\_18, Yelo\_18, Zenon\_19, Rope\_18
- Track 29 : Demikore\_25, Patience\_25, SuperSonics\_24, Labelle\_24, Madruga\_23
- Track 30 : Shrew\_53
- Track 31 : Wollypog\_8

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

The start number called the most often in the published annotations is 11, it was called in 84 of the 150 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Adjutor\_19, Aesir\_19, Ajin\_21, Anakin\_20, AnnaSerena\_20, Annapurna\_19, Artiphact\_20, Barnyard\_23, Beyoncage\_13, BigMama\_16, BiteSize\_13, Bramble\_21, Butterscotch\_18, Chill\_19, Chivey\_19, CoolCookie\_20, Crestdrop\_19, Cybele\_20, DannyDe\_19, Dauntless\_19, Delton\_18, Demikore\_25, Djokovic\_13, DrLupo\_25, Erk16\_18, Erudite\_19, FountainFog\_19, FreddieHg\_19, Gilda\_20, Giuseppe\_18, Gumball\_17, Hager\_21, Haunter\_20, Hawkeye\_20, Helpful\_19, Hiddenleaf\_19, JDawG\_19, JingleBells\_19, KandZ\_18, Karate\_19, Kate\_20, Kors\_21, Krampus\_20, Labelle\_24, LilyPad\_14, LittleFella\_15, LordBart\_21, Madi\_13, Madruga\_23, Megatron06\_19, Mopey\_18, MortySmith\_18, NarutoRun\_20, Neptune\_20, Nova\_18, Oaker\_17, OhDear\_20, OverHedge\_20, PBI1\_19, PLOT\_19, Patience\_25, Penelope2018\_18, Phalaborwa\_18, Pharpay\_20, PhunaPhoke\_20, Potty\_20, Poultruss\_19, Prager\_18, Predator\_21, Rachella\_20, Rie18\_20, RikSengupta\_21, Sienna\_13, SilentWarrior\_19, SirHarley\_17, Snakehole\_21, Sparcetus\_21, SuperSonics\_24, SuperheroCarly\_18, Suzy\_14, Tedro\_20, Terapin\_13, Thoth\_18, Thumb\_17, Tigg93\_20, TinyMiny\_21, Tongui\_19, Troll4\_18, Visconti\_18, WaldoWhy\_19, Wollypog\_8,

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

- Beckerton\_17, BobtimousPrime\_19, Cborch11\_18, Damien\_17, Konstantine\_22, Nish23\_18, Phreeze\_17, Puissant\_18,

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

- Aikoy\_13, Alephilan\_16, Alyssmiracle\_17, Apeppi\_16, Astralis\_16, Avian\_16, BirthdayBoy\_19, Candle\_18, Charminar\_16, Cuke\_11, DaviePasture\_18, DoobyDoo\_17, DumpTruck\_17, Erutan\_18, Fowlmouth\_12, Fulcrum\_19, GOATification\_19, Genamy16\_17, Gibbin\_19, GretellLyn\_18, Huwbart\_41, Indlulamithi\_15, Jalebi\_18, Jamemuya19\_16, Lambo\_18, LavAbarElk\_16, Leopard\_13, Lila22\_18, LuckyLeo\_17, Mima20\_17, MoiGyank\_20, MontyDev\_18, MrMiyagi\_12, Nilo\_19, NorManre\_19, NovaSharks\_17, Onyinye\_14, OtterstedtS21\_18, Papyrus\_18, ParvusTarda\_18, Patos\_19, Pywacket\_17,

Ranch\_18, RazorC\_16, Riduram\_16, Riparian\_18, Rope\_18, Rota\_17, Rukungu\_18, Rumi\_17, Sadboi\_18, Sampudon\_18, Send513\_18, Shrew\_53, Stormer\_16, Tillicus\_18, Triscuit\_40, Weiss13\_18, Wojtek\_17, Xenia2\_18, Yelo\_18, Yikes\_19, Zany\_17, Zenon\_19,

### Summary by start number:

#### Start 4:

- Found in 1 of 163 ( 0.6% ) of genes in pham
- Manual Annotations of this start: 1 of 150
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Shrew\_53 (singleton),

#### Start 5:

- Found in 10 of 163 ( 6.1% ) of genes in pham
- Manual Annotations of this start: 10 of 150
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Candle\_18 (R), MontyDev\_18 (R), Nilo\_19 (R), Papyrus\_18 (R), Riparian\_18 (R), Rope\_18 (R), Send513\_18 (R), Weiss13\_18 (R), Yelo\_18 (R), Zenon\_19 (R),

#### Start 6:

- Found in 1 of 163 ( 0.6% ) of genes in pham
- Manual Annotations of this start: 1 of 150
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Indlulamithi\_15 (AC),

#### Start 8:

- Found in 2 of 163 ( 1.2% ) of genes in pham
- Manual Annotations of this start: 2 of 150
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Huwbert\_41 (GG), Triscuit\_40 (GG),

#### Start 9:

- Found in 3 of 163 ( 1.8% ) of genes in pham
- Manual Annotations of this start: 3 of 150
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Cuke\_11 (AC), Fowlmouth\_12 (AC), MrMiyagi\_12 (AC),

#### Start 10:

- Found in 11 of 163 ( 6.7% ) of genes in pham
- Manual Annotations of this start: 7 of 150
- Called 72.7% of time when present
- Phage (with cluster) where this start called: Beckerton\_17 (H1), BobtimousPrime\_19 (H1), Cborch11\_18 (H1), Damien\_17 (H1), Konstantine\_22 (H1), Nish23\_18 (H1), Phreeze\_17 (H1), Puissant\_18 (H1),

#### Start 11:

- Found in 99 of 163 ( 60.7% ) of genes in pham
- Manual Annotations of this start: 84 of 150
- Called 91.9% of time when present

- Phage (with cluster) where this start called: Adjutor\_19 (D1), Aesir\_19 (EF), Ajin\_21 (EF), Anakin\_20 (EF), AnnaSerena\_20 (EF), Annapurna\_19 (EF), Artiphact\_20 (EF), Barnyard\_23 (H2), Beyoncage\_13 (DG1), BigMama\_16 (D1), BiteSize\_13 (DG1), Bramble\_21 (EF), Butterscotch\_18 (D1), Chill\_19 (D1), Chivey\_19 (EF), CoolCookie\_20 (EF), Crestdrop\_19 (EF), Cybele\_20 (EF), DannyDe\_19 (EF), Dauntless\_19 (EF), Delton\_18 (D1), Demikore\_25 (U), Djokovic\_13 (DG1), DrLupo\_25 (H2), Erk16\_18 (D1), Erudite\_19 (EF), FountainFog\_19 (EF), FreddieHg\_19 (EF), Gilda\_20 (EF), Giuseppe\_18 (D1), Gumball\_17 (D1), Hager\_21 (EF), Haunter\_20 (EF), Hawkeye\_20 (D2), Helpful\_19 (D1), Hiddenleaf\_19 (EF), JDawG\_19 (EF), JingleBells\_19 (EF), KandZ\_18 (D1), Karate\_19 (EF), Kate\_20 (EF), Kors\_21 (EF), Krampus\_20 (EF), Labelle\_24 (U), LilyPad\_14 (DG1), LittleFella\_15 (DG2), LordBart\_21 (EF), Madi\_13 (DG1), Madrug\_23 (U), Megatron06\_19 (H1), Mopey\_18 (D1), MortySmith\_18 (EF), NarutoRun\_20 (EF), Neptune\_20 (EF), Nova\_18 (D1), Oaker\_17 (H1), OhDear\_20 (EF), OverHedge\_20 (EF), PBI1\_19 (D1), PLOT\_19 (D1), Patience\_25 (U), Penelope2018\_18 (D1), Phalaborwa\_18 (D1), Pharpay\_20 (EF), PhunaPhoke\_20 (EF), Potty\_20 (EF), Poultruss\_19 (EF), Prager\_18 (D1), Predator\_21 (H1), Rachella\_20 (EF), Rie18\_20 (EF), RikSengupta\_21 (EF), Sienna\_13 (DG1), SilentWarrior\_19 (EF), SirHarley\_17 (D1), Snakehole\_21 (EF), Sparcetus\_21 (EF), SuperSonics\_24 (U), SuperheroCarly\_18 (D1), Suzy\_14 (DG1), Tedro\_20 (EF), Terapin\_13 (DG1), Thoth\_18 (D1), Thumb\_17 (H1), Tigg93\_20 (EF), TinyMiny\_21 (EF), Tongui\_19 (EF), Troll4\_18 (D1), Visconti\_18 (D1), WaldoWhy\_19 (D1), Wollypog\_8 (singleton),

#### Start 12:

- Found in 3 of 163 ( 1.8% ) of genes in pham
- Manual Annotations of this start: 3 of 150
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aikoy\_13 (AE), Leopard\_13 (AE), Onyinye\_14 (AE),

#### Start 13:

- Found in 44 of 163 ( 27.0% ) of genes in pham
- Manual Annotations of this start: 39 of 150
- Called 97.7% of time when present
- Phage (with cluster) where this start called: Alephlan\_16 (DV), Alyssmiracle\_17 (DV), Apeppi\_16 (DV), Astralis\_16 (DV), Avian\_16 (DV), BirthdayBoy\_19 (DV), Charminar\_16 (DV), DaviePasture\_18 (DV), DoobyDoo\_17 (DV), DumpTruck\_17 (DV), Erutan\_18 (DV), Fulcrum\_19 (DV), GOATification\_19 (DV), Genamy16\_17 (DV), Gibbin\_19 (DV), GretelLyn\_18 (DV), Jalebi\_18 (DV), Jamemuya19\_16 (DV), Lambo\_18 (DV), LavAbarElk\_16 (DV), Lila22\_18 (DV), LuckyLeo\_17 (DV), Mima20\_17 (DV), MoiGyank\_20 (DV), NorManre\_19 (DV), NovaSharks\_17 (DV), OtterstedtS21\_18 (DV), ParvusTarda\_18 (DV), Patos\_19 (DV), Pywacket\_17 (DV), Ranch\_18 (DV), RazorC\_16 (DV), Riduram\_16 (DV), Rukungu\_18 (DV), Rumi\_17 (DV), Sadboi\_18 (DV), Sampudon\_18 (DV), Stormer\_16 (DV), Tillicus\_18 (DV), Wojtek\_17 (DV), Xenia2\_18 (DV), Yikes\_19 (DV), Zany\_17 (DV),

#### Start 20:

- Found in 82 of 163 ( 50.3% ) of genes in pham
- No Manual Annotations of this start.
- Called 1.2% of time when present
- Phage (with cluster) where this start called: Rota\_17 (DV),

### Summary by clusters:

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

Info for manual annotations of cluster AC:

- Start number 6 was manually annotated 1 time for cluster AC.
- Start number 9 was manually annotated 3 times for cluster AC.

Info for manual annotations of cluster AE:

- Start number 12 was manually annotated 3 times for cluster AE.

Info for manual annotations of cluster D1:

- Start number 11 was manually annotated 22 times for cluster D1.

Info for manual annotations of cluster D2:

- Start number 11 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 11 was manually annotated 1 time for cluster DG2.

Info for manual annotations of cluster DV:

- Start number 13 was manually annotated 39 times for cluster DV.

Info for manual annotations of cluster EF:

- Start number 11 was manually annotated 42 times for cluster EF.

Info for manual annotations of cluster GG:

- Start number 8 was manually annotated 2 times for cluster GG.

Info for manual annotations of cluster H1:

- Start number 10 was manually annotated 7 times for cluster H1.
- Start number 11 was manually annotated 4 times for cluster H1.

Info for manual annotations of cluster H2:

- Start number 11 was manually annotated 2 times for cluster H2.

Info for manual annotations of cluster R:

- Start number 5 was manually annotated 10 times for cluster R.

Info for manual annotations of cluster U:

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

### ***Gene Information:***

Gene: Adjutor\_19 Start: 12400, Stop: 12732, Start Num: 11

Candidate Starts for Adjutor\_19:

(Start: 11 @12400 has 84 MA's), (30, 12517), (34, 12538), (39, 12568), (45, 12619), (47, 12628), (55, 12694),

Gene: Aesir\_19 Start: 11130, Stop: 11438, Start Num: 11

Candidate Starts for Aesir\_19:

(Start: 11 @11130 has 84 MA's), (20, 11181), (51, 11385),

Gene: Aikoy\_13 Start: 4647, Stop: 5045, Start Num: 12

Candidate Starts for Aikoy\_13:

(Start: 12 @4647 has 3 MA's), (15, 4668), (30, 4773), (39, 4824), (41, 4845), (46, 4881),

Gene: Ajin\_21 Start: 11286, Stop: 11603, Start Num: 11

Candidate Starts for Ajin\_21:

(Start: 11 @11286 has 84 MA's), (18, 11322), (33, 11421), (35, 11445), (42, 11490), (43, 11499),

Gene: Alephilan\_16 Start: 12943, Stop: 13254, Start Num: 13

Candidate Starts for Alephilan\_16:

(Start: 13 @12943 has 39 MA's), (20, 12985), (29, 13048), (38, 13096), (42, 13129), (43, 13138),

Gene: Alyssamiracle\_17 Start: 11350, Stop: 11661, Start Num: 13

Candidate Starts for Alyssamiracle\_17:

(Start: 13 @11350 has 39 MA's), (20, 11392), (29, 11455), (38, 11503), (42, 11536), (43, 11545),

Gene: Anakin\_20 Start: 11340, Stop: 11648, Start Num: 11

Candidate Starts for Anakin\_20:

(Start: 11 @11340 has 84 MA's), (20, 11391), (51, 11595),

Gene: AnnaSerena\_20 Start: 11349, Stop: 11657, Start Num: 11

Candidate Starts for AnnaSerena\_20:

(Start: 11 @11349 has 84 MA's), (20, 11400), (51, 11604),

Gene: Annapurna\_19 Start: 10549, Stop: 10857, Start Num: 11

Candidate Starts for Annapurna\_19:

(Start: 11 @10549 has 84 MA's), (20, 10600), (51, 10804),

Gene: Apeppi\_16 Start: 13065, Stop: 13376, Start Num: 13

Candidate Starts for Apeppi\_16:

(Start: 13 @13065 has 39 MA's), (24, 13140), (29, 13170), (38, 13218), (42, 13251),

Gene: Artiphact\_20 Start: 11341, Stop: 11649, Start Num: 11

Candidate Starts for Artiphact\_20:

(Start: 11 @11341 has 84 MA's), (20, 11392), (51, 11596),

Gene: Astralis\_16 Start: 11350, Stop: 11661, Start Num: 13

Candidate Starts for Astralis\_16:

(Start: 13 @11350 has 39 MA's), (20, 11392), (29, 11455), (38, 11503), (42, 11536), (43, 11545),

Gene: Avian\_16 Start: 11350, Stop: 11661, Start Num: 13

Candidate Starts for Avian\_16:

(Start: 13 @11350 has 39 MA's), (20, 11392), (29, 11455), (38, 11503), (42, 11536), (43, 11545),

Gene: Barnyard\_23 Start: 13941, Stop: 14273, Start Num: 11

Candidate Starts for Barnyard\_23:

(Start: 11 @13941 has 84 MA's), (43, 14148), (46, 14169),

Gene: Beckerton\_17 Start: 12784, Stop: 13161, Start Num: 10

Candidate Starts for Beckerton\_17:

(Start: 10 @12784 has 7 MA's), (Start: 11 @12790 has 84 MA's), (27, 12895), (37, 12955), (46, 13021), (48, 13030), (61, 13132), (62, 13150),

Gene: Beyoncage\_13 Start: 8817, Stop: 9137, Start Num: 11

Candidate Starts for Beyoncage\_13:

(Start: 11 @8817 has 84 MA's), (28, 8919), (38, 8976), (39, 8982),

Gene: BigMama\_16 Start: 12476, Stop: 12808, Start Num: 11

Candidate Starts for BigMama\_16:

(Start: 11 @12476 has 84 MA's), (30, 12593), (34, 12614), (39, 12644), (45, 12695), (47, 12704), (55, 12770),

Gene: BirthdayBoy\_19 Start: 13796, Stop: 14107, Start Num: 13

Candidate Starts for BirthdayBoy\_19:

(Start: 13 @13796 has 39 MA's), (20, 13838), (29, 13901), (38, 13949), (42, 13982), (43, 13991),

Gene: BiteSize\_13 Start: 8817, Stop: 9137, Start Num: 11

Candidate Starts for BiteSize\_13:

(Start: 11 @8817 has 84 MA's), (28, 8919), (38, 8976), (39, 8982),

Gene: BobtimousPrime\_19 Start: 12704, Stop: 13081, Start Num: 10

Candidate Starts for BobtimousPrime\_19:

(Start: 10 @12704 has 7 MA's), (Start: 11 @12710 has 84 MA's), (27, 12815), (37, 12875), (46, 12941), (48, 12950), (61, 13052), (62, 13070),

Gene: Bramble\_21 Start: 11251, Stop: 11568, Start Num: 11

Candidate Starts for Bramble\_21:

(Start: 11 @11251 has 84 MA's), (18, 11287), (33, 11386), (35, 11410), (42, 11455), (43, 11464),

Gene: Butterscotch\_18 Start: 12460, Stop: 12792, Start Num: 11

Candidate Starts for Butterscotch\_18:

(Start: 11 @12460 has 84 MA's), (30, 12577), (34, 12598), (39, 12628), (45, 12679), (47, 12688), (55, 12754),

Gene: Candle\_18 Start: 12792, Stop: 13160, Start Num: 5

Candidate Starts for Candle\_18:

(2, 12735), (Start: 5 @12792 has 10 MA's), (24, 12906), (27, 12921), (30, 12939), (42, 13002), (46, 13032), (50, 13053), (53, 13077),

Gene: Cborch11\_18 Start: 12247, Stop: 12624, Start Num: 10

Candidate Starts for Cborch11\_18:

(3, 12193), (Start: 10 @12247 has 7 MA's), (Start: 11 @12253 has 84 MA's), (27, 12358), (37, 12418), (46, 12484), (48, 12493), (61, 12595), (62, 12613),

Gene: Charminar\_16 Start: 11350, Stop: 11661, Start Num: 13

Candidate Starts for Charminar\_16:

(Start: 13 @11350 has 39 MA's), (20, 11392), (29, 11455), (38, 11503), (42, 11536), (43, 11545),

Gene: Chill\_19 Start: 12466, Stop: 12798, Start Num: 11

Candidate Starts for Chill\_19:

(Start: 11 @12466 has 84 MA's), (30, 12583), (34, 12604), (39, 12634), (45, 12685), (47, 12694), (55, 12760),

Gene: Chivey\_19 Start: 10542, Stop: 10850, Start Num: 11

Candidate Starts for Chivey\_19:

(Start: 11 @10542 has 84 MA's), (20, 10593), (51, 10797),

Gene: CoolCookie\_20 Start: 11347, Stop: 11655, Start Num: 11

Candidate Starts for CoolCookie\_20:

(Start: 11 @11347 has 84 MA's), (20, 11398), (51, 11602),

Gene: Crestdrop\_19 Start: 10416, Stop: 10724, Start Num: 11

Candidate Starts for Crestdrop\_19:

(Start: 11 @10416 has 84 MA's), (20, 10467), (51, 10671),

Gene: Cuke\_11 Start: 7988, Stop: 8332, Start Num: 9

Candidate Starts for Cuke\_11:

(Start: 9 @7988 has 3 MA's), (14, 8012), (16, 8021), (17, 8027), (25, 8084), (30, 8117), (46, 8213), (49, 8231),

Gene: Cybele\_20 Start: 11317, Stop: 11625, Start Num: 11

Candidate Starts for Cybele\_20:

(Start: 11 @11317 has 84 MA's), (20, 11368), (51, 11572),

Gene: Damien\_17 Start: 12246, Stop: 12623, Start Num: 10

Candidate Starts for Damien\_17:

(Start: 10 @12246 has 7 MA's), (Start: 11 @12252 has 84 MA's), (27, 12357), (37, 12417), (46, 12483), (48, 12492), (61, 12594), (62, 12612),

Gene: DannyDe\_19 Start: 10534, Stop: 10842, Start Num: 11

Candidate Starts for DannyDe\_19:

(Start: 11 @10534 has 84 MA's), (20, 10585), (51, 10789),

Gene: Dauntless\_19 Start: 11059, Stop: 11367, Start Num: 11

Candidate Starts for Dauntless\_19:

(Start: 11 @11059 has 84 MA's), (20, 11110), (51, 11314),

Gene: DaviePasture\_18 Start: 13553, Stop: 13864, Start Num: 13

Candidate Starts for DaviePasture\_18:

(Start: 13 @13553 has 39 MA's), (20, 13595), (29, 13658), (38, 13706), (42, 13739), (43, 13748),

Gene: Delton\_18 Start: 12472, Stop: 12804, Start Num: 11

Candidate Starts for Delton\_18:

(Start: 11 @12472 has 84 MA's), (30, 12589), (34, 12610), (39, 12640), (45, 12691), (47, 12700), (55, 12766),

Gene: Demikore\_25 Start: 15499, Stop: 15828, Start Num: 11

Candidate Starts for Demikore\_25:

(Start: 11 @15499 has 84 MA's), (24, 15589), (25, 15592), (34, 15643), (36, 15658), (37, 15664), (52, 15769),

Gene: Djokovic\_13 Start: 8817, Stop: 9137, Start Num: 11

Candidate Starts for Djokovic\_13:

(Start: 11 @8817 has 84 MA's), (28, 8919), (38, 8976), (39, 8982),

Gene: DoobyDoo\_17 Start: 12730, Stop: 13041, Start Num: 13

Candidate Starts for DoobyDoo\_17:

(Start: 13 @12730 has 39 MA's), (20, 12772), (29, 12835), (38, 12883), (42, 12916), (43, 12925),

Gene: DrLupo\_25 Start: 14352, Stop: 14684, Start Num: 11

Candidate Starts for DrLupo\_25:

(Start: 11 @14352 has 84 MA's), (43, 14559), (46, 14580), (54, 14628), (60, 14679),

Gene: DumpTruck\_17 Start: 12984, Stop: 13295, Start Num: 13

Candidate Starts for DumpTruck\_17:

(Start: 13 @12984 has 39 MA's), (20, 13026), (24, 13059), (42, 13170), (45, 13194), (46, 13200), (59, 13284),

Gene: Erk16\_18 Start: 12463, Stop: 12795, Start Num: 11

Candidate Starts for Erk16\_18:

(Start: 11 @12463 has 84 MA's), (30, 12580), (34, 12601), (39, 12631), (45, 12682), (47, 12691), (55, 12757),

Gene: Erudite\_19 Start: 11059, Stop: 11367, Start Num: 11

Candidate Starts for Erudite\_19:

(Start: 11 @11059 has 84 MA's), (20, 11110), (51, 11314),

Gene: Erutan\_18 Start: 13243, Stop: 13554, Start Num: 13

Candidate Starts for Erutan\_18:

(Start: 13 @13243 has 39 MA's), (20, 13285), (29, 13348), (38, 13396), (42, 13429), (43, 13438),

Gene: FountainFog\_19 Start: 10668, Stop: 10976, Start Num: 11

Candidate Starts for FountainFog\_19:

(Start: 11 @10668 has 84 MA's), (20, 10719),

Gene: Fowlmouth\_12 Start: 8156, Stop: 8503, Start Num: 9

Candidate Starts for Fowlmouth\_12:

(Start: 9 @8156 has 3 MA's), (16, 8192), (20, 8213), (25, 8255), (30, 8288), (46, 8384),

Gene: FreddieHg\_19 Start: 10558, Stop: 10866, Start Num: 11

Candidate Starts for FreddieHg\_19:

(Start: 11 @10558 has 84 MA's), (20, 10609), (51, 10813),

Gene: Fulcrum\_19 Start: 13776, Stop: 14087, Start Num: 13

Candidate Starts for Fulcrum\_19:

(Start: 13 @13776 has 39 MA's), (20, 13818), (29, 13881), (38, 13929), (42, 13962), (43, 13971),

Gene: GOATification\_19 Start: 13776, Stop: 14087, Start Num: 13

Candidate Starts for GOATification\_19:

(Start: 13 @13776 has 39 MA's), (20, 13818), (29, 13881), (38, 13929), (42, 13962), (43, 13971),

Gene: Genamy16\_17 Start: 11350, Stop: 11661, Start Num: 13

Candidate Starts for Genamy16\_17:

(Start: 13 @11350 has 39 MA's), (20, 11392), (29, 11455), (38, 11503), (42, 11536), (43, 11545),

Gene: Gibbin\_19 Start: 13836, Stop: 14147, Start Num: 13

Candidate Starts for Gibbin\_19:

(Start: 13 @13836 has 39 MA's), (20, 13878), (29, 13941), (38, 13989), (42, 14022), (43, 14031),

Gene: Gilda\_20 Start: 11341, Stop: 11649, Start Num: 11

Candidate Starts for Gilda\_20:

(Start: 11 @11341 has 84 MA's), (20, 11392), (51, 11596),

Gene: Giuseppe\_18 Start: 12452, Stop: 12784, Start Num: 11

Candidate Starts for Giuseppe\_18:

(Start: 11 @12452 has 84 MA's), (30, 12569), (34, 12590), (39, 12620), (45, 12671), (47, 12680), (55, 12746),

Gene: GretelLyn\_18 Start: 14110, Stop: 14421, Start Num: 13

Candidate Starts for GretelLyn\_18:

(Start: 13 @14110 has 39 MA's), (20, 14152), (29, 14215), (38, 14263), (42, 14296), (43, 14305),

Gene: Gumball\_17 Start: 12410, Stop: 12742, Start Num: 11

Candidate Starts for Gumball\_17:

(Start: 11 @12410 has 84 MA's), (30, 12527), (34, 12548), (39, 12578), (45, 12629), (47, 12638), (55, 12704),

Gene: Hager\_21 Start: 10912, Stop: 11220, Start Num: 11

Candidate Starts for Hager\_21:

(Start: 11 @10912 has 84 MA's), (20, 10963),

Gene: Haunter\_20 Start: 10754, Stop: 11062, Start Num: 11

Candidate Starts for Haunter\_20:

(Start: 11 @10754 has 84 MA's), (20, 10805), (51, 11009),

Gene: Hawkeye\_20 Start: 12347, Stop: 12667, Start Num: 11

Candidate Starts for Hawkeye\_20:

(Start: 11 @12347 has 84 MA's), (45, 12566),

Gene: Helpful\_19 Start: 12460, Stop: 12792, Start Num: 11

Candidate Starts for Helpful\_19:

(Start: 11 @12460 has 84 MA's), (30, 12577), (34, 12598), (39, 12628), (45, 12679), (47, 12688), (55, 12754),

Gene: Hiddenleaf\_19 Start: 10542, Stop: 10850, Start Num: 11

Candidate Starts for Hiddenleaf\_19:

(Start: 11 @10542 has 84 MA's), (20, 10593), (51, 10797),

Gene: Huwbert\_41 Start: 21622, Stop: 21954, Start Num: 8

Candidate Starts for Huwbert\_41:

(Start: 8 @21622 has 2 MA's), (15, 21658), (39, 21805), (46, 21862), (56, 21928),

Gene: Indlulamithi\_15 Start: 10237, Stop: 10599, Start Num: 6

Candidate Starts for Indlulamithi\_15:

(Start: 6 @10237 has 1 MA's), (25, 10348), (26, 10357), (38, 10426), (46, 10474), (53, 10519), (57, 10558),

Gene: JDawG\_19 Start: 11124, Stop: 11432, Start Num: 11

Candidate Starts for JDawG\_19:

(Start: 11 @11124 has 84 MA's), (20, 11175), (51, 11379),

Gene: Jalebi\_18 Start: 14286, Stop: 14597, Start Num: 13

Candidate Starts for Jalebi\_18:

(Start: 13 @14286 has 39 MA's), (20, 14328), (29, 14391), (38, 14439), (42, 14472), (43, 14481),

Gene: Jamemuya19\_16 Start: 11350, Stop: 11661, Start Num: 13

Candidate Starts for Jamemuya19\_16:

(Start: 13 @11350 has 39 MA's), (20, 11392), (29, 11455), (38, 11503), (42, 11536), (43, 11545),

Gene: JingleBells\_19 Start: 10623, Stop: 10931, Start Num: 11

Candidate Starts for JingleBells\_19:

(Start: 11 @10623 has 84 MA's), (20, 10674), (51, 10878),

Gene: KandZ\_18 Start: 12560, Stop: 12892, Start Num: 11

Candidate Starts for KandZ\_18:

(Start: 11 @12560 has 84 MA's), (30, 12677), (34, 12698), (39, 12728), (45, 12779), (47, 12788), (55, 12854),

Gene: Karate\_19 Start: 10762, Stop: 11070, Start Num: 11

Candidate Starts for Karate\_19:

(Start: 11 @10762 has 84 MA's), (20, 10813),

Gene: Kate\_20 Start: 11349, Stop: 11657, Start Num: 11

Candidate Starts for Kate\_20:

(Start: 11 @11349 has 84 MA's), (20, 11400), (51, 11604),

Gene: Konstantine\_22 Start: 13448, Stop: 13825, Start Num: 10

Candidate Starts for Konstantine\_22:

(Start: 10 @13448 has 7 MA's), (Start: 11 @13454 has 84 MA's), (27, 13559), (37, 13619), (46, 13685), (48, 13694), (61, 13796), (62, 13814),

Gene: Kors\_21 Start: 11332, Stop: 11649, Start Num: 11

Candidate Starts for Kors\_21:

(Start: 11 @11332 has 84 MA's), (18, 11368), (33, 11467), (35, 11491), (42, 11536), (43, 11545),

Gene: Krampus\_20 Start: 11347, Stop: 11655, Start Num: 11

Candidate Starts for Krampus\_20:

(Start: 11 @11347 has 84 MA's), (20, 11398), (51, 11602),

Gene: Labelle\_24 Start: 15501, Stop: 15830, Start Num: 11

Candidate Starts for Labelle\_24:

(Start: 11 @15501 has 84 MA's), (24, 15591), (25, 15594), (34, 15645), (36, 15660), (37, 15666), (52, 15771),

Gene: Lambo\_18 Start: 13780, Stop: 14091, Start Num: 13

Candidate Starts for Lambo\_18:

(Start: 13 @13780 has 39 MA's), (20, 13822), (29, 13885), (38, 13933), (42, 13966),

Gene: LavAbarElk\_16 Start: 12213, Stop: 12524, Start Num: 13

Candidate Starts for LavAbarElk\_16:

(Start: 13 @12213 has 39 MA's), (20, 12255), (29, 12318), (38, 12366), (42, 12399), (43, 12408),

Gene: Leopard\_13 Start: 4825, Stop: 5223, Start Num: 12  
Candidate Starts for Leopard\_13:  
(Start: 12 @4825 has 3 MA's), (15, 4846), (30, 4951), (39, 5002), (41, 5023), (46, 5059),

Gene: Lila22\_18 Start: 13734, Stop: 14045, Start Num: 13  
Candidate Starts for Lila22\_18:  
(Start: 13 @13734 has 39 MA's), (20, 13776), (29, 13839), (38, 13887), (42, 13920), (43, 13929),

Gene: LilyPad\_14 Start: 9536, Stop: 9856, Start Num: 11  
Candidate Starts for LilyPad\_14:  
(Start: 11 @9536 has 84 MA's), (28, 9638), (29, 9647), (38, 9695),

Gene: LittleFella\_15 Start: 11437, Stop: 11757, Start Num: 11  
Candidate Starts for LittleFella\_15:  
(Start: 11 @11437 has 84 MA's), (28, 11539),

Gene: LordBart\_21 Start: 11248, Stop: 11565, Start Num: 11  
Candidate Starts for LordBart\_21:  
(Start: 11 @11248 has 84 MA's), (18, 11284), (33, 11383), (35, 11407), (42, 11452), (43, 11461),

Gene: LuckyLeo\_17 Start: 13065, Stop: 13376, Start Num: 13  
Candidate Starts for LuckyLeo\_17:  
(Start: 13 @13065 has 39 MA's), (24, 13140), (29, 13170), (38, 13218), (42, 13251),

Gene: Madi\_13 Start: 8817, Stop: 9137, Start Num: 11  
Candidate Starts for Madi\_13:  
(Start: 11 @8817 has 84 MA's), (28, 8919), (38, 8976), (39, 8982),

Gene: Madruga\_23 Start: 15170, Stop: 15499, Start Num: 11  
Candidate Starts for Madruga\_23:  
(Start: 11 @15170 has 84 MA's), (24, 15260), (25, 15263), (34, 15314), (36, 15329), (37, 15335), (52, 15440),

Gene: Megatron06\_19 Start: 12787, Stop: 13158, Start Num: 11  
Candidate Starts for Megatron06\_19:  
(Start: 10 @12781 has 7 MA's), (Start: 11 @12787 has 84 MA's), (27, 12892), (37, 12952), (46, 13018), (48, 13027), (61, 13129), (62, 13147),

Gene: Mima20\_17 Start: 13463, Stop: 13774, Start Num: 13  
Candidate Starts for Mima20\_17:  
(Start: 13 @13463 has 39 MA's), (20, 13505), (29, 13568), (38, 13616), (42, 13649), (43, 13658),

Gene: MoiGyank\_20 Start: 14147, Stop: 14458, Start Num: 13  
Candidate Starts for MoiGyank\_20:  
(Start: 13 @14147 has 39 MA's), (20, 14189), (29, 14252), (38, 14300), (42, 14333), (43, 14342),

Gene: MontyDev\_18 Start: 12450, Stop: 12818, Start Num: 5  
Candidate Starts for MontyDev\_18:  
(2, 12393), (Start: 5 @12450 has 10 MA's), (24, 12564), (27, 12579), (30, 12597), (42, 12660), (46, 12690), (50, 12711), (53, 12735),

Gene: Mopey\_18 Start: 12460, Stop: 12792, Start Num: 11  
Candidate Starts for Mopey\_18:

(Start: 11 @12460 has 84 MA's), (30, 12577), (34, 12598), (39, 12628), (45, 12679), (47, 12688), (55, 12754),

Gene: MortySmith\_18 Start: 10521, Stop: 10829, Start Num: 11

Candidate Starts for MortySmith\_18:

(Start: 11 @10521 has 84 MA's), (20, 10572), (51, 10776),

Gene: MrMiyagi\_12 Start: 8156, Stop: 8503, Start Num: 9

Candidate Starts for MrMiyagi\_12:

(Start: 9 @8156 has 3 MA's), (16, 8192), (20, 8213), (25, 8255), (30, 8288), (46, 8384),

Gene: NarutoRun\_20 Start: 11340, Stop: 11648, Start Num: 11

Candidate Starts for NarutoRun\_20:

(Start: 11 @11340 has 84 MA's), (20, 11391), (51, 11595),

Gene: Neptune\_20 Start: 11317, Stop: 11625, Start Num: 11

Candidate Starts for Neptune\_20:

(Start: 11 @11317 has 84 MA's), (20, 11368), (51, 11572),

Gene: Nilo\_19 Start: 12789, Stop: 13157, Start Num: 5

Candidate Starts for Nilo\_19:

(2, 12732), (Start: 5 @12789 has 10 MA's), (24, 12903), (27, 12918), (30, 12936), (42, 12999), (46, 13029), (50, 13050), (53, 13074),

Gene: Nish23\_18 Start: 12247, Stop: 12624, Start Num: 10

Candidate Starts for Nish23\_18:

(3, 12193), (Start: 10 @12247 has 7 MA's), (Start: 11 @12253 has 84 MA's), (27, 12358), (37, 12418), (46, 12484), (48, 12493), (61, 12595), (62, 12613),

Gene: NorManre\_19 Start: 13342, Stop: 13653, Start Num: 13

Candidate Starts for NorManre\_19:

(Start: 13 @13342 has 39 MA's), (20, 13384), (29, 13447), (38, 13495), (42, 13528), (43, 13537),

Gene: Nova\_18 Start: 12887, Stop: 13219, Start Num: 11

Candidate Starts for Nova\_18:

(Start: 11 @12887 has 84 MA's), (30, 13004), (34, 13025), (39, 13055), (45, 13106), (47, 13115), (55, 13181),

Gene: NovaSharks\_17 Start: 11350, Stop: 11661, Start Num: 13

Candidate Starts for NovaSharks\_17:

(Start: 13 @11350 has 39 MA's), (20, 11392), (29, 11455), (38, 11503), (42, 11536), (43, 11545),

Gene: Oaker\_17 Start: 12511, Stop: 12882, Start Num: 11

Candidate Starts for Oaker\_17:

(Start: 10 @12505 has 7 MA's), (Start: 11 @12511 has 84 MA's), (27, 12616), (37, 12676), (46, 12742), (48, 12751), (61, 12853), (62, 12871),

Gene: OhDear\_20 Start: 11346, Stop: 11654, Start Num: 11

Candidate Starts for OhDear\_20:

(Start: 11 @11346 has 84 MA's), (20, 11397), (51, 11601),

Gene: Onyinye\_14 Start: 4813, Stop: 5211, Start Num: 12

Candidate Starts for Onyinye\_14:

(Start: 12 @4813 has 3 MA's), (15, 4834), (30, 4939), (39, 4990), (41, 5011), (46, 5047),

Gene: OtterstedtS21\_18 Start: 13432, Stop: 13743, Start Num: 13

Candidate Starts for OtterstedtS21\_18:

(Start: 13 @13432 has 39 MA's), (20, 13474), (29, 13537), (38, 13585), (42, 13618), (43, 13627),

Gene: OverHedge\_20 Start: 11314, Stop: 11622, Start Num: 11

Candidate Starts for OverHedge\_20:

(Start: 11 @11314 has 84 MA's), (20, 11365), (51, 11569),

Gene: PBI1\_19 Start: 12391, Stop: 12723, Start Num: 11

Candidate Starts for PBI1\_19:

(Start: 11 @12391 has 84 MA's), (30, 12508), (34, 12529), (39, 12559), (45, 12610), (47, 12619), (55, 12685),

Gene: PLOT\_19 Start: 12463, Stop: 12795, Start Num: 11

Candidate Starts for PLOT\_19:

(Start: 11 @12463 has 84 MA's), (30, 12580), (34, 12601), (39, 12631), (45, 12682), (47, 12691), (55, 12757),

Gene: Papyrus\_18 Start: 12451, Stop: 12819, Start Num: 5

Candidate Starts for Papyrus\_18:

(2, 12394), (Start: 5 @12451 has 10 MA's), (24, 12565), (27, 12580), (30, 12598), (42, 12661), (46, 12691), (50, 12712), (53, 12736),

Gene: ParvusTarda\_18 Start: 12914, Stop: 13225, Start Num: 13

Candidate Starts for ParvusTarda\_18:

(Start: 13 @12914 has 39 MA's), (20, 12956), (29, 13019), (38, 13067), (42, 13100), (43, 13109),

Gene: Patience\_25 Start: 16060, Stop: 16389, Start Num: 11

Candidate Starts for Patience\_25:

(Start: 11 @16060 has 84 MA's), (24, 16150), (25, 16153), (34, 16204), (36, 16219), (37, 16225), (52, 16330),

Gene: Patos\_19 Start: 13342, Stop: 13653, Start Num: 13

Candidate Starts for Patos\_19:

(Start: 13 @13342 has 39 MA's), (20, 13384), (29, 13447), (38, 13495), (42, 13528), (43, 13537),

Gene: Penelope2018\_18 Start: 12460, Stop: 12792, Start Num: 11

Candidate Starts for Penelope2018\_18:

(Start: 11 @12460 has 84 MA's), (30, 12577), (34, 12598), (39, 12628), (45, 12679), (47, 12688), (55, 12754),

Gene: Phalaborwa\_18 Start: 12493, Stop: 12825, Start Num: 11

Candidate Starts for Phalaborwa\_18:

(Start: 11 @12493 has 84 MA's), (30, 12610), (34, 12631), (39, 12661), (45, 12712), (47, 12721), (55, 12787),

Gene: Pharpay\_20 Start: 11362, Stop: 11670, Start Num: 11

Candidate Starts for Pharpay\_20:

(Start: 11 @11362 has 84 MA's), (20, 11413), (51, 11617),

Gene: Phreeze\_17 Start: 12246, Stop: 12623, Start Num: 10

Candidate Starts for Phreeze\_17:

(Start: 10 @12246 has 7 MA's), (Start: 11 @12252 has 84 MA's), (27, 12357), (37, 12417), (46, 12483), (48, 12492), (61, 12594), (62, 12612),

Gene: PhunaPhoke\_20 Start: 11335, Stop: 11643, Start Num: 11

Candidate Starts for PhunaPhoke\_20:

(Start: 11 @11335 has 84 MA's), (20, 11386), (51, 11590),

Gene: Potty\_20 Start: 11340, Stop: 11648, Start Num: 11

Candidate Starts for Potty\_20:

(Start: 11 @11340 has 84 MA's), (20, 11391), (51, 11595),

Gene: Poultruss\_19 Start: 11113, Stop: 11421, Start Num: 11

Candidate Starts for Poultruss\_19:

(Start: 11 @11113 has 84 MA's), (20, 11164), (51, 11368),

Gene: Prager\_18 Start: 12472, Stop: 12804, Start Num: 11

Candidate Starts for Prager\_18:

(Start: 11 @12472 has 84 MA's), (30, 12589), (34, 12610), (39, 12640), (45, 12691), (47, 12700), (55, 12766),

Gene: Predator\_21 Start: 13774, Stop: 14148, Start Num: 11

Candidate Starts for Predator\_21:

(Start: 11 @13774 has 84 MA's), (23, 13840), (24, 13864), (27, 13879), (37, 13939), (46, 14005), (61, 14119),

Gene: Puissant\_18 Start: 12702, Stop: 13079, Start Num: 10

Candidate Starts for Puissant\_18:

(Start: 10 @12702 has 7 MA's), (Start: 11 @12708 has 84 MA's), (19, 12747), (24, 12798), (27, 12813), (31, 12834), (37, 12873), (46, 12939), (48, 12948), (61, 13050), (62, 13068),

Gene: Pywacket\_17 Start: 14271, Stop: 14582, Start Num: 13

Candidate Starts for Pywacket\_17:

(Start: 13 @14271 has 39 MA's), (20, 14313), (29, 14376), (38, 14424), (42, 14457), (43, 14466),

Gene: Rachella\_20 Start: 11343, Stop: 11651, Start Num: 11

Candidate Starts for Rachella\_20:

(Start: 11 @11343 has 84 MA's), (20, 11394), (51, 11598),

Gene: Ranch\_18 Start: 12280, Stop: 12591, Start Num: 13

Candidate Starts for Ranch\_18:

(Start: 13 @12280 has 39 MA's), (20, 12322), (29, 12385), (38, 12433), (42, 12466), (43, 12475),

Gene: RazorC\_16 Start: 11350, Stop: 11661, Start Num: 13

Candidate Starts for RazorC\_16:

(Start: 13 @11350 has 39 MA's), (20, 11392), (29, 11455), (38, 11503), (42, 11536), (43, 11545),

Gene: Riduram\_16 Start: 11320, Stop: 11631, Start Num: 13

Candidate Starts for Riduram\_16:

(Start: 13 @11320 has 39 MA's), (20, 11362), (29, 11425), (38, 11473), (42, 11506), (43, 11515),

Gene: Rie18\_20 Start: 10694, Stop: 11002, Start Num: 11

Candidate Starts for Rie18\_20:

(Start: 11 @10694 has 84 MA's), (20, 10745),

Gene: RikSengupta\_21 Start: 11369, Stop: 11686, Start Num: 11

Candidate Starts for RikSengupta\_21:

(Start: 11 @11369 has 84 MA's), (18, 11405), (33, 11504), (35, 11528), (42, 11573), (43, 11582),

Gene: Riparian\_18 Start: 12250, Stop: 12618, Start Num: 5

Candidate Starts for Riparian\_18:

(2, 12193), (Start: 5 @12250 has 10 MA's), (24, 12364), (27, 12379), (30, 12397), (42, 12460), (46, 12490), (50, 12511), (53, 12535),

Gene: Rope\_18 Start: 12442, Stop: 12810, Start Num: 5

Candidate Starts for Rope\_18:

(2, 12385), (Start: 5 @12442 has 10 MA's), (24, 12556), (27, 12571), (30, 12589), (42, 12652), (46, 12682), (50, 12703), (53, 12727),

Gene: Rota\_17 Start: 13280, Stop: 13549, Start Num: 20

Candidate Starts for Rota\_17:

(Start: 13 @13238 has 39 MA's), (20, 13280), (29, 13343), (38, 13391), (42, 13424), (43, 13433),

Gene: Rukungu\_18 Start: 13979, Stop: 14290, Start Num: 13

Candidate Starts for Rukungu\_18:

(Start: 13 @13979 has 39 MA's), (20, 14021), (29, 14084), (38, 14132), (42, 14165), (43, 14174),

Gene: Rumi\_17 Start: 11350, Stop: 11661, Start Num: 13

Candidate Starts for Rumi\_17:

(Start: 13 @11350 has 39 MA's), (20, 11392), (29, 11455), (38, 11503), (42, 11536), (43, 11545),

Gene: Sadboi\_18 Start: 14110, Stop: 14421, Start Num: 13

Candidate Starts for Sadboi\_18:

(Start: 13 @14110 has 39 MA's), (20, 14152), (29, 14215), (38, 14263), (42, 14296), (43, 14305),

Gene: Sampudon\_18 Start: 14286, Stop: 14597, Start Num: 13

Candidate Starts for Sampudon\_18:

(Start: 13 @14286 has 39 MA's), (20, 14328), (29, 14391), (38, 14439), (42, 14472), (43, 14481),

Gene: Send513\_18 Start: 12792, Stop: 13160, Start Num: 5

Candidate Starts for Send513\_18:

(2, 12735), (Start: 5 @12792 has 10 MA's), (24, 12906), (27, 12921), (30, 12939), (42, 13002), (46, 13032), (50, 13053), (53, 13077),

Gene: Shrew\_53 Start: 26061, Stop: 26411, Start Num: 4

Candidate Starts for Shrew\_53:

(1, 25848), (Start: 4 @26061 has 1 MA's), (7, 26082), (21, 26163), (22, 26166), (24, 26193), (32, 26232), (44, 26316), (47, 26334),

Gene: Sienna\_13 Start: 8817, Stop: 9137, Start Num: 11

Candidate Starts for Sienna\_13:

(Start: 11 @8817 has 84 MA's), (28, 8919), (38, 8976), (39, 8982),

Gene: SilentWarrior\_19 Start: 10550, Stop: 10858, Start Num: 11

Candidate Starts for SilentWarrior\_19:

(Start: 11 @10550 has 84 MA's), (20, 10601), (51, 10805),

Gene: SirHarley\_17 Start: 12392, Stop: 12724, Start Num: 11

Candidate Starts for SirHarley\_17:

(Start: 11 @12392 has 84 MA's), (30, 12509), (34, 12530), (39, 12560), (45, 12611), (47, 12620), (55, 12686),

Gene: Snakehole\_21 Start: 10639, Stop: 10947, Start Num: 11

Candidate Starts for Snakehole\_21:

(Start: 11 @10639 has 84 MA's), (20, 10690), (51, 10894),

Gene: Sparcetus\_21 Start: 11248, Stop: 11565, Start Num: 11

Candidate Starts for Sparcetus\_21:

(Start: 11 @11248 has 84 MA's), (18, 11284), (33, 11383), (35, 11407), (42, 11452), (43, 11461),

Gene: Stormer\_16 Start: 11350, Stop: 11661, Start Num: 13

Candidate Starts for Stormer\_16:

(Start: 13 @11350 has 39 MA's), (20, 11392), (29, 11455), (38, 11503), (42, 11536), (43, 11545),

Gene: SuperSonics\_24 Start: 15227, Stop: 15556, Start Num: 11

Candidate Starts for SuperSonics\_24:

(Start: 11 @15227 has 84 MA's), (24, 15317), (25, 15320), (34, 15371), (36, 15386), (37, 15392), (52, 15497),

Gene: SuperheroCarly\_18 Start: 12322, Stop: 12654, Start Num: 11

Candidate Starts for SuperheroCarly\_18:

(Start: 11 @12322 has 84 MA's), (30, 12439), (34, 12460), (39, 12490), (45, 12541), (47, 12550), (55, 12616),

Gene: Suzy\_14 Start: 10045, Stop: 10365, Start Num: 11

Candidate Starts for Suzy\_14:

(Start: 11 @10045 has 84 MA's), (28, 10147), (38, 10204), (39, 10210), (40, 10228), (45, 10261),

Gene: Tedro\_20 Start: 10813, Stop: 11121, Start Num: 11

Candidate Starts for Tedro\_20:

(Start: 11 @10813 has 84 MA's), (20, 10864), (51, 11068),

Gene: Terapin\_13 Start: 8817, Stop: 9137, Start Num: 11

Candidate Starts for Terapin\_13:

(Start: 11 @8817 has 84 MA's), (28, 8919), (38, 8976), (39, 8982),

Gene: Thoth\_18 Start: 12457, Stop: 12789, Start Num: 11

Candidate Starts for Thoth\_18:

(Start: 11 @12457 has 84 MA's), (30, 12574), (34, 12595), (39, 12625), (45, 12676), (47, 12685), (55, 12751),

Gene: Thumb\_17 Start: 12253, Stop: 12624, Start Num: 11

Candidate Starts for Thumb\_17:

(Start: 10 @12247 has 7 MA's), (Start: 11 @12253 has 84 MA's), (27, 12358), (37, 12418), (46, 12484), (48, 12493), (61, 12595), (62, 12613),

Gene: Tiggy93\_20 Start: 11346, Stop: 11654, Start Num: 11

Candidate Starts for Tiggy93\_20:

(Start: 11 @11346 has 84 MA's), (20, 11397), (51, 11601),

Gene: Tillicus\_18 Start: 12659, Stop: 12970, Start Num: 13  
Candidate Starts for Tillicus\_18:  
(Start: 13 @12659 has 39 MA's), (29, 12764), (38, 12812), (42, 12845),

Gene: TinyMiny\_21 Start: 11267, Stop: 11584, Start Num: 11  
Candidate Starts for TinyMiny\_21:  
(Start: 11 @11267 has 84 MA's), (18, 11303), (33, 11402), (35, 11426), (42, 11471), (43, 11480),

Gene: Tongui\_19 Start: 10686, Stop: 10994, Start Num: 11  
Candidate Starts for Tongui\_19:  
(Start: 11 @10686 has 84 MA's), (20, 10737),

Gene: Triscuit\_40 Start: 21537, Stop: 21869, Start Num: 8  
Candidate Starts for Triscuit\_40:  
(Start: 8 @21537 has 2 MA's), (15, 21573), (39, 21720), (46, 21777), (56, 21843),

Gene: Troll4\_18 Start: 12461, Stop: 12793, Start Num: 11  
Candidate Starts for Troll4\_18:  
(Start: 11 @12461 has 84 MA's), (30, 12578), (34, 12599), (39, 12629), (45, 12680), (47, 12689), (55, 12755),

Gene: Visconti\_18 Start: 12470, Stop: 12802, Start Num: 11  
Candidate Starts for Visconti\_18:  
(Start: 11 @12470 has 84 MA's), (30, 12587), (34, 12608), (39, 12638), (45, 12689), (47, 12698), (55, 12764),

Gene: WaldoWhy\_19 Start: 12466, Stop: 12798, Start Num: 11  
Candidate Starts for WaldoWhy\_19:  
(Start: 11 @12466 has 84 MA's), (30, 12583), (34, 12604), (39, 12634), (45, 12685), (47, 12694), (55, 12760),

Gene: Weiss13\_18 Start: 12482, Stop: 12850, Start Num: 5  
Candidate Starts for Weiss13\_18:  
(2, 12425), (Start: 5 @12482 has 10 MA's), (24, 12596), (27, 12611), (30, 12629), (42, 12692), (46, 12722), (50, 12743), (53, 12767),

Gene: Wojtek\_17 Start: 12987, Stop: 13298, Start Num: 13  
Candidate Starts for Wojtek\_17:  
(Start: 13 @12987 has 39 MA's), (20, 13029), (29, 13092), (38, 13140), (42, 13173), (43, 13182),

Gene: Wollypog\_8 Start: 7934, Stop: 8242, Start Num: 11  
Candidate Starts for Wollypog\_8:  
(Start: 11 @7934 has 84 MA's), (24, 8015), (46, 8156), (52, 8195), (58, 8228),

Gene: Xenia2\_18 Start: 13026, Stop: 13337, Start Num: 13  
Candidate Starts for Xenia2\_18:  
(Start: 13 @13026 has 39 MA's), (20, 13068), (24, 13101), (42, 13212), (45, 13236), (46, 13242), (59, 13326),

Gene: Yelo\_18 Start: 12792, Stop: 13160, Start Num: 5  
Candidate Starts for Yelo\_18:

(2, 12735), (Start: 5 @12792 has 10 MA's), (24, 12906), (27, 12921), (30, 12939), (42, 13002), (46, 13032), (50, 13053), (53, 13077),

Gene: Yikes\_19 Start: 14371, Stop: 14682, Start Num: 13

Candidate Starts for Yikes\_19:

(Start: 13 @14371 has 39 MA's), (20, 14413), (29, 14476), (38, 14524), (42, 14557), (43, 14566),

Gene: Zany\_17 Start: 13500, Stop: 13811, Start Num: 13

Candidate Starts for Zany\_17:

(Start: 13 @13500 has 39 MA's), (20, 13542), (29, 13605), (38, 13653), (42, 13686), (43, 13695),

Gene: Zenon\_19 Start: 12794, Stop: 13162, Start Num: 5

Candidate Starts for Zenon\_19:

(2, 12737), (Start: 5 @12794 has 10 MA's), (24, 12908), (27, 12923), (30, 12941), (42, 13004), (46, 13034), (50, 13055), (53, 13079),