

Pham 202767



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 202767 Report

This analysis was run 01/18/25 on database version 583.

Pham number 202767 has 132 members, 15 are drafts.

Phages represented in each track:

- Track 1 : Fowlmouth\_9, MrMiyagi\_9
- Track 2 : Cuke\_8
- Track 3 : Indlulamithi\_11
- Track 4 : Leopard\_26, Onyinye\_27, Aikoy\_26
- Track 5 : PLOT\_16, Giuseppe\_15, WaldoWhy\_16, Helpful\_16, Delton\_15, Thoth\_15, Chill\_16, Visconti\_15, Penelope2018\_15, Troll4\_15, Mopey\_15
- Track 6 : Gumball\_14, KandZ\_15, SirHarley\_14, Nova\_15, BigMama\_13, Prager\_15, Erk16\_15, Adjutor\_16, PBI1\_16, Butterscotch\_15
- Track 7 : Hawkeye\_17
- Track 8 : LilyPad\_11
- Track 9 : Suzy\_11
- Track 10 : Djokovic\_10, Terapin\_10, BiteSize\_10, Madi\_10, Sienna\_10, Beyoncage\_10
- Track 11 : LittleFella\_12
- Track 12 : Astralis\_13, Ranch\_14, Sampudon\_15, Genamy16\_13, Patos\_15, DaviePasture\_14, Rumi\_13, GretelLyn\_14, Avian\_13, Sadboi\_14, Jalebi\_15, Alyssamiracle\_13, NovaSharks\_13, Yikes\_15, Jamemuya19\_12, NorManre\_15, RazorC\_13, Erutan\_14, Mima20\_14
- Track 13 : OtterstedtS21\_14, Fulcrum\_15, Gibbin\_15, Lila22\_15, ParvusTarda\_14, DoobyDoo\_13, MoiGyank\_16, BirthdayBoy\_15, GOATification\_15
- Track 14 : Lambo\_14
- Track 15 : LuckyLeo\_14, Apeppi\_13, Tillicus\_15
- Track 16 : DumpTruck\_13, Xenia2\_12
- Track 17 : Alephilan\_12
- Track 18 : Zany\_14
- Track 19 : Wojtek\_13
- Track 20 : NarutoRun\_17, Anakin\_17
- Track 21 : Cybele\_17, Kate\_17, Krampus\_17, OverHedge\_17, Rachella\_17, PhunaPhoke\_17, Artiphact\_17, Gilda\_17, Pharpay\_17, Karate\_16, Neptune\_17, AnnaSerena\_17
- Track 22 : CoolCookie\_17
- Track 23 : Tedro\_17, Haunter\_17
- Track 24 : Ajin\_18, TinyMiny\_18, RikSengupta\_18, Kors\_19, Sparcetus\_18, LordBart\_18
- Track 25 : MortySmith\_15, Chivey\_16, Dauntless\_16, Erudite\_16, FreddieHg\_16, Annapurna\_17, Aesir\_16, DannyDe\_16, Snakehole\_18, SilentWarrior\_16, JDawG\_16, JingleBells\_16, Hiddenleaf\_16, Crestdrop\_16, Poultruss\_16

- Track 26 : Hager\_18, Potty\_17
- Track 27 : Rie18\_17
- Track 28 : Huwbert\_38, Triscuit\_37
- Track 29 : Damien\_14, Phreeze\_14, Beckerton\_14, Thumb\_14, Konstantine\_19, Oaker\_14
- Track 30 : Predator\_18
- Track 31 : Cborch11\_15, Megatron06\_16
- Track 32 : Puissant\_13
- Track 33 : DrLupo\_22
- Track 34 : Barnyard\_20
- Track 35 : Shrew\_49
- Track 36 : Wollypog\_5

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

The start number called the most often in the published annotations is 12, it was called in 75 of the 117 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Adjutor\_16, Aesir\_16, Aikoy\_26, Ajin\_18, Anakin\_17, AnnaSerena\_17, Annapurna\_17, Artiphact\_17, Beyoncage\_10, BigMama\_13, BiteSize\_10, Butterscotch\_15, Chill\_16, Chivey\_16, CoolCookie\_17, Crestdrop\_16, Cuke\_8, Cybele\_17, DannyDe\_16, Dauntless\_16, Delton\_15, Djokovic\_10, Erk16\_15, Erudite\_16, Fowlmouth\_9, FreddieHg\_16, Gilda\_17, Giuseppe\_15, Gumball\_14, Hager\_18, Haunter\_17, Hawkeye\_17, Helpful\_16, Hiddenleaf\_16, Indlulamithi\_11, JDawG\_16, JingleBells\_16, KandZ\_15, Karate\_16, Kate\_17, Kors\_19, Krampus\_17, Leopard\_26, LilyPad\_11, LittleFella\_12, LordBart\_18, Madi\_10, Mopey\_15, MortySmith\_15, MrMiyagi\_9, NarutoRun\_17, Neptune\_17, Nova\_15, Onyinye\_27, OverHedge\_17, PBI1\_16, PLOT\_16, Penelope2018\_15, Pharpay\_17, PhunaPhoke\_17, Potty\_17, Poultruss\_16, Prager\_15, Rachella\_17, Rie18\_17, RikSengupta\_18, Shrew\_49, Sienna\_10, SilentWarrior\_16, SirHarley\_14, Snakehole\_18, Sparcetus\_18, Suzy\_11, Tedro\_17, Terapin\_10, Thoth\_15, TinyMiny\_18, Troll4\_15, Visconti\_15, WaldoWhy\_16, Wollypog\_5,

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

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

- Alephlan\_12, Alyssamiracle\_13, Apeppi\_13, Astralis\_13, Avian\_13, Barnyard\_20, Beckerton\_14, BirthdayBoy\_15, Cborch11\_15, Damien\_14, DaviePasture\_14, DoobyDoo\_13, DrLupo\_22, DumpTruck\_13, Erutan\_14, Fulcrum\_15, GOATification\_15, Genamy16\_13, Gibbin\_15, GretelLyn\_14, Huwbert\_38, Jalebi\_15, Jamemuya19\_12, Konstantine\_19, Lambo\_14, Lila22\_15, LuckyLeo\_14, Megatron06\_16, Mima20\_14, MoiGyank\_16, NorManre\_15, NovaSharks\_13, Oaker\_14, OtterstedtS21\_14, ParvusTarda\_14, Patos\_15, Phreeze\_14, Predator\_18, Puissant\_13, Ranch\_14, RazorC\_13, Rumi\_13, Sadboi\_14, Sampudon\_15, Thumb\_14, Tillicus\_15, Triscuit\_37, Wojtek\_13, Xenia2\_12, Yikes\_15, Zany\_14,

**Summary by start number:**

Start 8:

- Found in 2 of 132 ( 1.5% ) of genes in pham
- Manual Annotations of this start: 2 of 117
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Barnyard\_20 (H2), DrLupo\_22 (H2),

Start 9:

- Found in 2 of 132 ( 1.5% ) of genes in pham
- Manual Annotations of this start: 2 of 117
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Huwbert\_38 (GG), Triscuit\_37 (GG),

Start 10:

- Found in 10 of 132 ( 7.6% ) of genes in pham
- Manual Annotations of this start: 9 of 117
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Beckerton\_14 (H1), Cborch11\_15 (H1), Damien\_14 (H1), Konstantine\_19 (H1), Megatron06\_16 (H1), Oaker\_14 (H1), Phreeze\_14 (H1), Predator\_18 (H1), Puissant\_13 (H1), Thumb\_14 (H1),

Start 11:

- Found in 37 of 132 ( 28.0% ) of genes in pham
- Manual Annotations of this start: 29 of 117
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Alephlan\_12 (DV), Alyssamiracle\_13 (DV), Apeppi\_13 (DV), Astralis\_13 (DV), Avian\_13 (DV), BirthdayBoy\_15 (DV), DaviePasture\_14 (DV), DoobyDoo\_13 (DV), DumpTruck\_13 (DV), Erutan\_14 (DV), Fulcrum\_15 (DV), GOATification\_15 (DV), Genamy16\_13 (DV), Gibbin\_15 (DV), GretelLyn\_14 (DV), Jalebi\_15 (DV), Jamemuya19\_12 (DV), Lambo\_14 (DV), Lila22\_15 (DV), LuckyLeo\_14 (DV), Mima20\_14 (DV), MoiGyank\_16 (DV), NorManre\_15 (DV), NovaSharks\_13 (DV), OtterstedtS21\_14 (DV), ParvusTarda\_14 (DV), Patos\_15 (DV), Ranch\_14 (DV), RazorC\_13 (DV), Rumi\_13 (DV), Sadboi\_14 (DV), Sampudon\_15 (DV), Tillicus\_15 (DV), Wojtek\_13 (DV), Xenia2\_12 (DV), Yikes\_15 (DV), Zany\_14 (DV),

Start 12:

- Found in 81 of 132 ( 61.4% ) of genes in pham
- Manual Annotations of this start: 75 of 117
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Adjutor\_16 (D1), Aesir\_16 (EF), Aikoy\_26 (AE), Ajin\_18 (EF), Anakin\_17 (EF), AnnaSerena\_17 (EF), Annapurna\_17 (EF), Artiphact\_17 (EF), Beyoncage\_10 (DG1), BigMama\_13 (D1), BiteSize\_10 (DG1), Butterscotch\_15 (D1), Chill\_16 (D1), Chivey\_16 (EF), CoolCookie\_17 (EF), Crestdrop\_16 (EF), Cuke\_8 (AC), Cybele\_17 (EF), DannyDe\_16 (EF), Dauntless\_16 (EF), Delton\_15 (D1), Djokovic\_10 (DG1), Erk16\_15 (D1), Erudite\_16 (EF), Fowlmouth\_9 (AC), FreddieHg\_16 (EF), Gilda\_17 (EF), Giuseppe\_15 (D1), Gumball\_14 (D1), Hager\_18 (EF), Haunter\_17 (EF), Hawkeye\_17 (D2), Helpful\_16 (D1), Hiddenleaf\_16 (EF), Indlulamithi\_11 (AC), JDawG\_16 (EF), JingleBells\_16 (EF), KandZ\_15 (D1), Karate\_16 (EF), Kate\_17 (EF), Kors\_19 (EF), Krampus\_17 (EF), Leopard\_26 (AE), LilyPad\_11 (DG1), LittleFella\_12 (DG2), LordBart\_18 (EF), Madi\_10 (DG1), Mopey\_15 (D1), MortySmith\_15 (EF), MrMiyagi\_9 (AC), NarutoRun\_17 (EF), Neptune\_17 (EF), Nova\_15 (D1), Onyinye\_27 (AE), OverHedge\_17 (EF), PBI1\_16 (D1), PLOT\_16 (D1), Penelope2018\_15 (D1),

Pharpay\_17 (EF), PhunaPhoke\_17 (EF), Potty\_17 (EF), Poultress\_16 (EF), Prager\_15 (D1), Rachella\_17 (EF), Rie18\_17 (EF), RikSengupta\_18 (EF), Shrew\_49 (singleton), Sienna\_10 (DG1), SilentWarrior\_16 (EF), SirHarley\_14 (D1), Snakehole\_18 (EF), Sparcetus\_18 (EF), Suzy\_11 (DG1), Tedro\_17 (EF), Terapin\_10 (DG1), Thoth\_15 (D1), TinyMiny\_18 (EF), Troll4\_15 (D1), Visconti\_15 (D1), WaldoWhy\_16 (D1), Wollypog\_5 (singleton),

### **Summary by clusters:**

There are 12 clusters represented in this pham: DG2, AC, H1, AE, H2, EF, singleton, GG, DG1, DV, D2, D1,

Info for manual annotations of cluster AC:

- Start number 12 was manually annotated 4 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 12 was manually annotated 21 times for cluster D1.

Info for manual annotations of cluster D2:

- Start number 12 was manually annotated 1 time for cluster D2.

Info for manual annotations of cluster DG1:

- Start number 12 was manually annotated 8 times for cluster DG1.

Info for manual annotations of cluster DG2:

- Start number 12 was manually annotated 1 time for cluster DG2.

Info for manual annotations of cluster DV:

- Start number 11 was manually annotated 29 times for cluster DV.

Info for manual annotations of cluster EF:

- Start number 12 was manually annotated 35 times for cluster EF.

Info for manual annotations of cluster GG:

- Start number 9 was manually annotated 2 times for cluster GG.

Info for manual annotations of cluster H1:

- Start number 10 was manually annotated 9 times for cluster H1.

Info for manual annotations of cluster H2:

- Start number 8 was manually annotated 2 times for cluster H2.

### **Gene Information:**

Gene: Adjutor\_16 Start: 10392, Stop: 10811, Start Num: 12

Candidate Starts for Adjutor\_16:

(Start: 12 @10392 has 75 MA's), (21, 10488), (23, 10515), (24, 10539), (26, 10548), (28, 10554), (35, 10587), (38, 10596), (57, 10773),

Gene: Aesir\_16 Start: 9070, Stop: 9429, Start Num: 12  
Candidate Starts for Aesir\_16:  
(Start: 12 @9070 has 75 MA's), (38, 9277), (42, 9295), (56, 9415),

Gene: Aikoy\_26 Start: 16296, Stop: 16724, Start Num: 12  
Candidate Starts for Aikoy\_26:  
(Start: 12 @16296 has 75 MA's), (23, 16419), (26, 16452), (27, 16455), (29, 16461), (35, 16509), (38, 16518), (52, 16647), (53, 16665),

Gene: Ajin\_18 Start: 9126, Stop: 9482, Start Num: 12  
Candidate Starts for Ajin\_18:  
(Start: 12 @9126 has 75 MA's), (14, 9162), (21, 9222), (35, 9321),

Gene: Alephilan\_12 Start: 10817, Stop: 11206, Start Num: 11  
Candidate Starts for Alephilan\_12:  
(Start: 11 @10817 has 29 MA's), (25, 10973), (26, 10979), (38, 11027),

Gene: Alyssamiracle\_13 Start: 9224, Stop: 9613, Start Num: 11  
Candidate Starts for Alyssamiracle\_13:  
(Start: 11 @9224 has 29 MA's), (25, 9380), (26, 9386), (27, 9389), (38, 9434),

Gene: Anakin\_17 Start: 9282, Stop: 9638, Start Num: 12  
Candidate Starts for Anakin\_17:  
(Start: 12 @9282 has 75 MA's), (38, 9489), (47, 9546), (56, 9624),

Gene: AnnaSerena\_17 Start: 9288, Stop: 9644, Start Num: 12  
Candidate Starts for AnnaSerena\_17:  
(Start: 12 @9288 has 75 MA's), (38, 9495), (47, 9552), (56, 9630),

Gene: Annapurna\_17 Start: 8489, Stop: 8848, Start Num: 12  
Candidate Starts for Annapurna\_17:  
(Start: 12 @8489 has 75 MA's), (38, 8696), (42, 8714), (56, 8834),

Gene: Apeppi\_13 Start: 10933, Stop: 11331, Start Num: 11  
Candidate Starts for Apeppi\_13:  
(Start: 11 @10933 has 29 MA's), (38, 11143),

Gene: Artiphact\_17 Start: 9280, Stop: 9636, Start Num: 12  
Candidate Starts for Artiphact\_17:  
(Start: 12 @9280 has 75 MA's), (38, 9487), (47, 9544), (56, 9622),

Gene: Astralis\_13 Start: 9224, Stop: 9613, Start Num: 11  
Candidate Starts for Astralis\_13:  
(Start: 11 @9224 has 29 MA's), (25, 9380), (26, 9386), (27, 9389), (38, 9434),

Gene: Avian\_13 Start: 9224, Stop: 9613, Start Num: 11  
Candidate Starts for Avian\_13:  
(Start: 11 @9224 has 29 MA's), (25, 9380), (26, 9386), (27, 9389), (38, 9434),

Gene: Barnyard\_20 Start: 11230, Stop: 11703, Start Num: 8  
Candidate Starts for Barnyard\_20:

(Start: 8 @11230 has 2 MA's), (17, 11317), (21, 11353), (30, 11431), (32, 11443), (39, 11500), (50, 11605), (57, 11677),

Gene: Beckerton\_14 Start: 10316, Stop: 10822, Start Num: 10

Candidate Starts for Beckerton\_14:

(Start: 10 @10316 has 9 MA's), (19, 10421), (23, 10457), (24, 10481), (36, 10559), (37, 10568), (38, 10571), (49, 10658), (57, 10748), (62, 10799),

Gene: Beyoncage\_10 Start: 6697, Stop: 7074, Start Num: 12

Candidate Starts for Beyoncage\_10:

(Start: 12 @6697 has 75 MA's), (38, 6901), (50, 6976),

Gene: BigMama\_13 Start: 10465, Stop: 10884, Start Num: 12

Candidate Starts for BigMama\_13:

(Start: 12 @10465 has 75 MA's), (21, 10561), (23, 10588), (24, 10612), (26, 10621), (28, 10627), (35, 10660), (38, 10669), (57, 10846),

Gene: BirthdayBoy\_15 Start: 11670, Stop: 12059, Start Num: 11

Candidate Starts for BirthdayBoy\_15:

(Start: 11 @11670 has 29 MA's), (25, 11826), (26, 11832), (27, 11835), (38, 11880), (51, 11973),

Gene: BiteSize\_10 Start: 6697, Stop: 7074, Start Num: 12

Candidate Starts for BiteSize\_10:

(Start: 12 @6697 has 75 MA's), (38, 6901), (50, 6976),

Gene: Butterscotch\_15 Start: 10452, Stop: 10871, Start Num: 12

Candidate Starts for Butterscotch\_15:

(Start: 12 @10452 has 75 MA's), (21, 10548), (23, 10575), (24, 10599), (26, 10608), (28, 10614), (35, 10647), (38, 10656), (57, 10833),

Gene: Cborch11\_15 Start: 9778, Stop: 10284, Start Num: 10

Candidate Starts for Cborch11\_15:

(Start: 10 @9778 has 9 MA's), (19, 9883), (23, 9919), (24, 9943), (36, 10021), (38, 10033), (49, 10120), (57, 10210), (62, 10261),

Gene: Chill\_16 Start: 10455, Stop: 10874, Start Num: 12

Candidate Starts for Chill\_16:

(Start: 12 @10455 has 75 MA's), (19, 10542), (21, 10551), (23, 10578), (24, 10602), (26, 10611), (28, 10617), (35, 10650), (38, 10659), (57, 10836),

Gene: Chivey\_16 Start: 8482, Stop: 8841, Start Num: 12

Candidate Starts for Chivey\_16:

(Start: 12 @8482 has 75 MA's), (38, 8689), (42, 8707), (56, 8827),

Gene: CoolCookie\_17 Start: 9286, Stop: 9642, Start Num: 12

Candidate Starts for CoolCookie\_17:

(Start: 12 @9286 has 75 MA's), (38, 9493), (47, 9550), (56, 9628),

Gene: Crestdrop\_16 Start: 8356, Stop: 8715, Start Num: 12

Candidate Starts for Crestdrop\_16:

(Start: 12 @8356 has 75 MA's), (38, 8563), (42, 8581), (56, 8701),

Gene: Cuke\_8 Start: 5912, Stop: 6340, Start Num: 12

Candidate Starts for Cuke\_8:

(Start: 12 @5912 has 75 MA's), (20, 6002), (27, 6071), (38, 6116), (42, 6134), (53, 6269), (61, 6326),

Gene: Cybele\_17 Start: 9256, Stop: 9612, Start Num: 12

Candidate Starts for Cybele\_17:

(Start: 12 @9256 has 75 MA's), (38, 9463), (47, 9520), (56, 9598),

Gene: Damien\_14 Start: 9778, Stop: 10284, Start Num: 10

Candidate Starts for Damien\_14:

(Start: 10 @9778 has 9 MA's), (19, 9883), (23, 9919), (24, 9943), (36, 10021), (37, 10030), (38, 10033), (49, 10120), (57, 10210), (62, 10261),

Gene: DannyDe\_16 Start: 8474, Stop: 8833, Start Num: 12

Candidate Starts for DannyDe\_16:

(Start: 12 @8474 has 75 MA's), (38, 8681), (42, 8699), (56, 8819),

Gene: Dauntless\_16 Start: 8999, Stop: 9358, Start Num: 12

Candidate Starts for Dauntless\_16:

(Start: 12 @8999 has 75 MA's), (38, 9206), (42, 9224), (56, 9344),

Gene: DaviePasture\_14 Start: 11427, Stop: 11816, Start Num: 11

Candidate Starts for DaviePasture\_14:

(Start: 11 @11427 has 29 MA's), (25, 11583), (26, 11589), (27, 11592), (38, 11637),

Gene: Delton\_15 Start: 10461, Stop: 10880, Start Num: 12

Candidate Starts for Delton\_15:

(Start: 12 @10461 has 75 MA's), (19, 10548), (21, 10557), (23, 10584), (24, 10608), (26, 10617), (28, 10623), (35, 10656), (38, 10665), (57, 10842),

Gene: Djokovic\_10 Start: 6697, Stop: 7074, Start Num: 12

Candidate Starts for Djokovic\_10:

(Start: 12 @6697 has 75 MA's), (38, 6901), (50, 6976),

Gene: DoobyDoo\_13 Start: 10604, Stop: 10993, Start Num: 11

Candidate Starts for DoobyDoo\_13:

(Start: 11 @10604 has 29 MA's), (25, 10760), (26, 10766), (27, 10769), (38, 10814), (51, 10907),

Gene: DrLupo\_22 Start: 11658, Stop: 12131, Start Num: 8

Candidate Starts for DrLupo\_22:

(7, 11646), (Start: 8 @11658 has 2 MA's), (21, 11781), (26, 11844), (32, 11871), (39, 11928), (56, 12099),

Gene: DumpTruck\_13 Start: 10861, Stop: 11247, Start Num: 11

Candidate Starts for DumpTruck\_13:

(Start: 11 @10861 has 29 MA's), (15, 10915), (20, 10957), (27, 11026), (38, 11071),

Gene: Erk16\_15 Start: 10455, Stop: 10874, Start Num: 12

Candidate Starts for Erk16\_15:

(Start: 12 @10455 has 75 MA's), (21, 10551), (23, 10578), (24, 10602), (26, 10611), (28, 10617), (35, 10650), (38, 10659), (57, 10836),

Gene: Erudite\_16 Start: 8999, Stop: 9358, Start Num: 12

Candidate Starts for Erudite\_16:



(Start: 12 @8999 has 75 MA's), (38, 9206), (42, 9224), (56, 9344),

Gene: Erutan\_14 Start: 11117, Stop: 11506, Start Num: 11

Candidate Starts for Erutan\_14:

(Start: 11 @11117 has 29 MA's), (25, 11273), (26, 11279), (27, 11282), (38, 11327),

Gene: Fowlmouth\_9 Start: 6076, Stop: 6507, Start Num: 12

Candidate Starts for Fowlmouth\_9:

(Start: 12 @6076 has 75 MA's), (18, 6154), (20, 6166), (38, 6280), (54, 6451), (57, 6463), (59, 6472), (61, 6493),

Gene: FreddieHg\_16 Start: 8498, Stop: 8857, Start Num: 12

Candidate Starts for FreddieHg\_16:

(Start: 12 @8498 has 75 MA's), (38, 8705), (42, 8723), (56, 8843),

Gene: Fulcrum\_15 Start: 11650, Stop: 12039, Start Num: 11

Candidate Starts for Fulcrum\_15:

(Start: 11 @11650 has 29 MA's), (25, 11806), (26, 11812), (27, 11815), (38, 11860), (51, 11953),

Gene: GOATification\_15 Start: 11650, Stop: 12039, Start Num: 11

Candidate Starts for GOATification\_15:

(Start: 11 @11650 has 29 MA's), (25, 11806), (26, 11812), (27, 11815), (38, 11860), (51, 11953),

Gene: Genamy16\_13 Start: 9224, Stop: 9613, Start Num: 11

Candidate Starts for Genamy16\_13:

(Start: 11 @9224 has 29 MA's), (25, 9380), (26, 9386), (27, 9389), (38, 9434),

Gene: Gibbin\_15 Start: 11710, Stop: 12099, Start Num: 11

Candidate Starts for Gibbin\_15:

(Start: 11 @11710 has 29 MA's), (25, 11866), (26, 11872), (27, 11875), (38, 11920), (51, 12013),

Gene: Gilda\_17 Start: 9280, Stop: 9636, Start Num: 12

Candidate Starts for Gilda\_17:

(Start: 12 @9280 has 75 MA's), (38, 9487), (47, 9544), (56, 9622),

Gene: Giuseppe\_15 Start: 10444, Stop: 10863, Start Num: 12

Candidate Starts for Giuseppe\_15:

(Start: 12 @10444 has 75 MA's), (19, 10531), (21, 10540), (23, 10567), (24, 10591), (26, 10600), (28, 10606), (35, 10639), (38, 10648), (57, 10825),

Gene: GretelLyn\_14 Start: 11984, Stop: 12373, Start Num: 11

Candidate Starts for GretelLyn\_14:

(Start: 11 @11984 has 29 MA's), (25, 12140), (26, 12146), (27, 12149), (38, 12194),

Gene: Gumball\_14 Start: 10399, Stop: 10821, Start Num: 12

Candidate Starts for Gumball\_14:

(Start: 12 @10399 has 75 MA's), (21, 10495), (23, 10522), (24, 10546), (26, 10555), (28, 10561), (35, 10594), (38, 10603), (57, 10780),

Gene: Hager\_18 Start: 8855, Stop: 9211, Start Num: 12

Candidate Starts for Hager\_18:

(Start: 12 @8855 has 75 MA's), (38, 9062), (47, 9119), (56, 9197),

Gene: Haunter\_17 Start: 8696, Stop: 9052, Start Num: 12  
Candidate Starts for Haunter\_17:  
(Start: 12 @8696 has 75 MA's), (38, 8903), (47, 8960), (56, 9038),

Gene: Hawkeye\_17 Start: 10361, Stop: 10765, Start Num: 12  
Candidate Starts for Hawkeye\_17:  
(1, 9983), (2, 10025), (4, 10157), (5, 10166), (6, 10262), (Start: 12 @10361 has 75 MA's), (24, 10508),  
(26, 10517), (28, 10523), (38, 10565), (53, 10715), (56, 10736),

Gene: Helpful\_16 Start: 10452, Stop: 10871, Start Num: 12  
Candidate Starts for Helpful\_16:  
(Start: 12 @10452 has 75 MA's), (19, 10539), (21, 10548), (23, 10575), (24, 10599), (26, 10608), (28,  
10614), (35, 10647), (38, 10656), (57, 10833),

Gene: Hiddenleaf\_16 Start: 8482, Stop: 8841, Start Num: 12  
Candidate Starts for Hiddenleaf\_16:  
(Start: 12 @8482 has 75 MA's), (38, 8689), (42, 8707), (56, 8827),

Gene: Huwbert\_38 Start: 19477, Stop: 19938, Start Num: 9  
Candidate Starts for Huwbert\_38:  
(Start: 9 @19477 has 2 MA's), (20, 19573), (22, 19603), (28, 19648), (34, 19693), (44, 19774),

Gene: Indlulamithi\_11 Start: 7639, Stop: 8055, Start Num: 12  
Candidate Starts for Indlulamithi\_11:  
(Start: 12 @7639 has 75 MA's), (17, 7702), (38, 7843),

Gene: JDawG\_16 Start: 9064, Stop: 9423, Start Num: 12  
Candidate Starts for JDawG\_16:  
(Start: 12 @9064 has 75 MA's), (38, 9271), (42, 9289), (56, 9409),

Gene: Jalebi\_15 Start: 12160, Stop: 12549, Start Num: 11  
Candidate Starts for Jalebi\_15:  
(Start: 11 @12160 has 29 MA's), (25, 12316), (26, 12322), (27, 12325), (38, 12370),

Gene: Jamemuya19\_12 Start: 9224, Stop: 9613, Start Num: 11  
Candidate Starts for Jamemuya19\_12:  
(Start: 11 @9224 has 29 MA's), (25, 9380), (26, 9386), (27, 9389), (38, 9434),

Gene: JingleBells\_16 Start: 8559, Stop: 8918, Start Num: 12  
Candidate Starts for JingleBells\_16:  
(Start: 12 @8559 has 75 MA's), (38, 8766), (42, 8784), (56, 8904),

Gene: KandZ\_15 Start: 10549, Stop: 10971, Start Num: 12  
Candidate Starts for KandZ\_15:  
(Start: 12 @10549 has 75 MA's), (21, 10645), (23, 10672), (24, 10696), (26, 10705), (28, 10711), (35,  
10744), (38, 10753), (57, 10930),

Gene: Karate\_16 Start: 8704, Stop: 9060, Start Num: 12  
Candidate Starts for Karate\_16:  
(Start: 12 @8704 has 75 MA's), (38, 8911), (47, 8968), (56, 9046),

Gene: Kate\_17 Start: 9288, Stop: 9644, Start Num: 12  
Candidate Starts for Kate\_17:

(Start: 12 @9288 has 75 MA's), (38, 9495), (47, 9552), (56, 9630),

Gene: Konstantine\_19 Start: 10980, Stop: 11486, Start Num: 10

Candidate Starts for Konstantine\_19:

(Start: 10 @10980 has 9 MA's), (19, 11085), (23, 11121), (24, 11145), (36, 11223), (37, 11232), (38, 11235), (49, 11322), (57, 11412), (62, 11463),

Gene: Kors\_19 Start: 9156, Stop: 9512, Start Num: 12

Candidate Starts for Kors\_19:

(Start: 12 @9156 has 75 MA's), (14, 9192), (21, 9252), (35, 9351),

Gene: Krampus\_17 Start: 9286, Stop: 9642, Start Num: 12

Candidate Starts for Krampus\_17:

(Start: 12 @9286 has 75 MA's), (38, 9493), (47, 9550), (56, 9628),

Gene: Lambo\_14 Start: 11654, Stop: 12043, Start Num: 11

Candidate Starts for Lambo\_14:

(Start: 11 @11654 has 29 MA's), (26, 11816), (27, 11819), (38, 11864),

Gene: Leopard\_26 Start: 16581, Stop: 17009, Start Num: 12

Candidate Starts for Leopard\_26:

(Start: 12 @16581 has 75 MA's), (23, 16704), (26, 16737), (27, 16740), (29, 16746), (35, 16794), (38, 16803), (52, 16932), (53, 16950),

Gene: Lila22\_15 Start: 11608, Stop: 11997, Start Num: 11

Candidate Starts for Lila22\_15:

(Start: 11 @11608 has 29 MA's), (25, 11764), (26, 11770), (27, 11773), (38, 11818), (51, 11911),

Gene: LilyPad\_11 Start: 7439, Stop: 7816, Start Num: 12

Candidate Starts for LilyPad\_11:

(Start: 12 @7439 has 75 MA's), (13, 7469), (24, 7586), (41, 7658), (56, 7784), (57, 7790),

Gene: LittleFella\_12 Start: 9274, Stop: 9663, Start Num: 12

Candidate Starts for LittleFella\_12:

(Start: 12 @9274 has 75 MA's), (19, 9361), (24, 9421), (26, 9430), (38, 9478), (55, 9616),

Gene: LordBart\_18 Start: 9129, Stop: 9485, Start Num: 12

Candidate Starts for LordBart\_18:

(Start: 12 @9129 has 75 MA's), (14, 9165), (21, 9225), (35, 9324),

Gene: LuckyLeo\_14 Start: 10933, Stop: 11331, Start Num: 11

Candidate Starts for LuckyLeo\_14:

(Start: 11 @10933 has 29 MA's), (38, 11143),

Gene: Madi\_10 Start: 6697, Stop: 7074, Start Num: 12

Candidate Starts for Madi\_10:

(Start: 12 @6697 has 75 MA's), (38, 6901), (50, 6976),

Gene: Megatron06\_16 Start: 10313, Stop: 10819, Start Num: 10

Candidate Starts for Megatron06\_16:

(Start: 10 @10313 has 9 MA's), (19, 10418), (23, 10454), (24, 10478), (36, 10556), (38, 10568), (49, 10655), (57, 10745), (62, 10796),

Gene: Mima20\_14 Start: 11337, Stop: 11726, Start Num: 11

Candidate Starts for Mima20\_14:

(Start: 11 @11337 has 29 MA's), (25, 11493), (26, 11499), (27, 11502), (38, 11547),

Gene: MoiGyank\_16 Start: 12021, Stop: 12410, Start Num: 11

Candidate Starts for MoiGyank\_16:

(Start: 11 @12021 has 29 MA's), (25, 12177), (26, 12183), (27, 12186), (38, 12231), (51, 12324),

Gene: Mopey\_15 Start: 10452, Stop: 10871, Start Num: 12

Candidate Starts for Mopey\_15:

(Start: 12 @10452 has 75 MA's), (19, 10539), (21, 10548), (23, 10575), (24, 10599), (26, 10608), (28, 10614), (35, 10647), (38, 10656), (57, 10833),

Gene: MortySmith\_15 Start: 8461, Stop: 8820, Start Num: 12

Candidate Starts for MortySmith\_15:

(Start: 12 @8461 has 75 MA's), (38, 8668), (42, 8686), (56, 8806),

Gene: MrMiyagi\_9 Start: 6076, Stop: 6507, Start Num: 12

Candidate Starts for MrMiyagi\_9:

(Start: 12 @6076 has 75 MA's), (18, 6154), (20, 6166), (38, 6280), (54, 6451), (57, 6463), (59, 6472), (61, 6493),

Gene: NarutoRun\_17 Start: 9282, Stop: 9638, Start Num: 12

Candidate Starts for NarutoRun\_17:

(Start: 12 @9282 has 75 MA's), (38, 9489), (47, 9546), (56, 9624),

Gene: Neptune\_17 Start: 9256, Stop: 9612, Start Num: 12

Candidate Starts for Neptune\_17:

(Start: 12 @9256 has 75 MA's), (38, 9463), (47, 9520), (56, 9598),

Gene: NorManre\_15 Start: 11216, Stop: 11605, Start Num: 11

Candidate Starts for NorManre\_15:

(Start: 11 @11216 has 29 MA's), (25, 11372), (26, 11378), (27, 11381), (38, 11426),

Gene: Nova\_15 Start: 10876, Stop: 11298, Start Num: 12

Candidate Starts for Nova\_15:

(Start: 12 @10876 has 75 MA's), (21, 10972), (23, 10999), (24, 11023), (26, 11032), (28, 11038), (35, 11071), (38, 11080), (57, 11257),

Gene: NovaSharks\_13 Start: 9224, Stop: 9613, Start Num: 11

Candidate Starts for NovaSharks\_13:

(Start: 11 @9224 has 29 MA's), (25, 9380), (26, 9386), (27, 9389), (38, 9434),

Gene: Oaker\_14 Start: 10037, Stop: 10543, Start Num: 10

Candidate Starts for Oaker\_14:

(Start: 10 @10037 has 9 MA's), (19, 10142), (23, 10178), (24, 10202), (36, 10280), (37, 10289), (38, 10292), (49, 10379), (57, 10469), (62, 10520),

Gene: Onyinye\_27 Start: 16462, Stop: 16890, Start Num: 12

Candidate Starts for Onyinye\_27:

(Start: 12 @16462 has 75 MA's), (23, 16585), (26, 16618), (27, 16621), (29, 16627), (35, 16675), (38, 16684), (52, 16813), (53, 16831),

Gene: OtterstedtS21\_14 Start: 11306, Stop: 11695, Start Num: 11  
Candidate Starts for OtterstedtS21\_14:  
(Start: 11 @11306 has 29 MA's), (25, 11462), (26, 11468), (27, 11471), (38, 11516), (51, 11609),

Gene: OverHedge\_17 Start: 9253, Stop: 9609, Start Num: 12  
Candidate Starts for OverHedge\_17:  
(Start: 12 @9253 has 75 MA's), (38, 9460), (47, 9517), (56, 9595),

Gene: PBI1\_16 Start: 10383, Stop: 10802, Start Num: 12  
Candidate Starts for PBI1\_16:  
(Start: 12 @10383 has 75 MA's), (21, 10479), (23, 10506), (24, 10530), (26, 10539), (28, 10545), (35, 10578), (38, 10587), (57, 10764),

Gene: PLOT\_16 Start: 10455, Stop: 10874, Start Num: 12  
Candidate Starts for PLOT\_16:  
(Start: 12 @10455 has 75 MA's), (19, 10542), (21, 10551), (23, 10578), (24, 10602), (26, 10611), (28, 10617), (35, 10650), (38, 10659), (57, 10836),

Gene: ParvusTarda\_14 Start: 10788, Stop: 11177, Start Num: 11  
Candidate Starts for ParvusTarda\_14:  
(Start: 11 @10788 has 29 MA's), (25, 10944), (26, 10950), (27, 10953), (38, 10998), (51, 11091),

Gene: Patos\_15 Start: 11216, Stop: 11605, Start Num: 11  
Candidate Starts for Patos\_15:  
(Start: 11 @11216 has 29 MA's), (25, 11372), (26, 11378), (27, 11381), (38, 11426),

Gene: Penelope2018\_15 Start: 10452, Stop: 10871, Start Num: 12  
Candidate Starts for Penelope2018\_15:  
(Start: 12 @10452 has 75 MA's), (19, 10539), (21, 10548), (23, 10575), (24, 10599), (26, 10608), (28, 10614), (35, 10647), (38, 10656), (57, 10833),

Gene: Pharpay\_17 Start: 9301, Stop: 9657, Start Num: 12  
Candidate Starts for Pharpay\_17:  
(Start: 12 @9301 has 75 MA's), (38, 9508), (47, 9565), (56, 9643),

Gene: Phreeze\_14 Start: 9778, Stop: 10284, Start Num: 10  
Candidate Starts for Phreeze\_14:  
(Start: 10 @9778 has 9 MA's), (19, 9883), (23, 9919), (24, 9943), (36, 10021), (37, 10030), (38, 10033), (49, 10120), (57, 10210), (62, 10261),

Gene: PhunaPhoke\_17 Start: 9274, Stop: 9630, Start Num: 12  
Candidate Starts for PhunaPhoke\_17:  
(Start: 12 @9274 has 75 MA's), (38, 9481), (47, 9538), (56, 9616),

Gene: Potty\_17 Start: 9279, Stop: 9635, Start Num: 12  
Candidate Starts for Potty\_17:  
(Start: 12 @9279 has 75 MA's), (38, 9486), (47, 9543), (56, 9621),

Gene: Poultriss\_16 Start: 9053, Stop: 9412, Start Num: 12  
Candidate Starts for Poultriss\_16:  
(Start: 12 @9053 has 75 MA's), (38, 9260), (42, 9278), (56, 9398),

Gene: Prager\_15 Start: 10461, Stop: 10880, Start Num: 12

Candidate Starts for Prager\_15:

(Start: 12 @10461 has 75 MA's), (21, 10557), (23, 10584), (24, 10608), (26, 10617), (28, 10623), (35, 10656), (38, 10665), (57, 10842),

Gene: Predator\_18 Start: 11335, Stop: 11802, Start Num: 10

Candidate Starts for Predator\_18:

(Start: 10 @11335 has 9 MA's), (16, 11407), (32, 11536), (33, 11551), (37, 11587), (38, 11590), (49, 11677), (57, 11767), (58, 11770),

Gene: Puissant\_13 Start: 10247, Stop: 10702, Start Num: 10

Candidate Starts for Puissant\_13:

(Start: 10 @10247 has 9 MA's), (15, 10313), (19, 10352), (24, 10412), (26, 10421), (37, 10499), (38, 10502), (49, 10589), (56, 10673), (57, 10679),

Gene: Rachella\_17 Start: 9285, Stop: 9641, Start Num: 12

Candidate Starts for Rachella\_17:

(Start: 12 @9285 has 75 MA's), (38, 9492), (47, 9549), (56, 9627),

Gene: Ranch\_14 Start: 10154, Stop: 10543, Start Num: 11

Candidate Starts for Ranch\_14:

(Start: 11 @10154 has 29 MA's), (25, 10310), (26, 10316), (27, 10319), (38, 10364),

Gene: RazorC\_13 Start: 9224, Stop: 9613, Start Num: 11

Candidate Starts for RazorC\_13:

(Start: 11 @9224 has 29 MA's), (25, 9380), (26, 9386), (27, 9389), (38, 9434),

Gene: Rie18\_17 Start: 8639, Stop: 8995, Start Num: 12

Candidate Starts for Rie18\_17:

(3, 8312), (Start: 12 @8639 has 75 MA's), (38, 8846), (47, 8903), (56, 8981),

Gene: RikSengupta\_18 Start: 9208, Stop: 9564, Start Num: 12

Candidate Starts for RikSengupta\_18:

(Start: 12 @9208 has 75 MA's), (14, 9244), (21, 9304), (35, 9403),

Gene: Rumi\_13 Start: 9224, Stop: 9613, Start Num: 11

Candidate Starts for Rumi\_13:

(Start: 11 @9224 has 29 MA's), (25, 9380), (26, 9386), (27, 9389), (38, 9434),

Gene: Sadboi\_14 Start: 11984, Stop: 12373, Start Num: 11

Candidate Starts for Sadboi\_14:

(Start: 11 @11984 has 29 MA's), (25, 12140), (26, 12146), (27, 12149), (38, 12194),

Gene: Sampudon\_15 Start: 12160, Stop: 12549, Start Num: 11

Candidate Starts for Sampudon\_15:

(Start: 11 @12160 has 29 MA's), (25, 12316), (26, 12322), (27, 12325), (38, 12370),

Gene: Shrew\_49 Start: 23926, Stop: 24369, Start Num: 12

Candidate Starts for Shrew\_49:

(Start: 12 @23926 has 75 MA's), (28, 24088), (31, 24097), (40, 24175), (43, 24199),

Gene: Sienna\_10 Start: 6697, Stop: 7074, Start Num: 12

Candidate Starts for Sienna\_10:

(Start: 12 @6697 has 75 MA's), (38, 6901), (50, 6976),

Gene: SilentWarrior\_16 Start: 8490, Stop: 8849, Start Num: 12  
Candidate Starts for SilentWarrior\_16:  
(Start: 12 @8490 has 75 MA's), (38, 8697), (42, 8715), (56, 8835),

Gene: SirHarley\_14 Start: 10381, Stop: 10803, Start Num: 12  
Candidate Starts for SirHarley\_14:  
(Start: 12 @10381 has 75 MA's), (21, 10477), (23, 10504), (24, 10528), (26, 10537), (28, 10543), (35, 10576), (38, 10585), (57, 10762),

Gene: Snakehole\_18 Start: 8578, Stop: 8937, Start Num: 12  
Candidate Starts for Snakehole\_18:  
(Start: 12 @8578 has 75 MA's), (38, 8785), (42, 8803), (56, 8923),

Gene: Sparcetus\_18 Start: 9087, Stop: 9443, Start Num: 12  
Candidate Starts for Sparcetus\_18:  
(Start: 12 @9087 has 75 MA's), (14, 9123), (21, 9183), (35, 9282),

Gene: Suzy\_11 Start: 7940, Stop: 8317, Start Num: 12  
Candidate Starts for Suzy\_11:  
(Start: 12 @7940 has 75 MA's), (19, 8027), (35, 8135), (38, 8144), (50, 8219),

Gene: Tedro\_17 Start: 8752, Stop: 9108, Start Num: 12  
Candidate Starts for Tedro\_17:  
(Start: 12 @8752 has 75 MA's), (38, 8959), (47, 9016), (56, 9094),

Gene: Terapin\_10 Start: 6697, Stop: 7074, Start Num: 12  
Candidate Starts for Terapin\_10:  
(Start: 12 @6697 has 75 MA's), (38, 6901), (50, 6976),

Gene: Thoth\_15 Start: 10449, Stop: 10868, Start Num: 12  
Candidate Starts for Thoth\_15:  
(Start: 12 @10449 has 75 MA's), (19, 10536), (21, 10545), (23, 10572), (24, 10596), (26, 10605), (28, 10611), (35, 10644), (38, 10653), (57, 10830),

Gene: Thumb\_14 Start: 9779, Stop: 10285, Start Num: 10  
Candidate Starts for Thumb\_14:  
(Start: 10 @9779 has 9 MA's), (19, 9884), (23, 9920), (24, 9944), (36, 10022), (37, 10031), (38, 10034), (49, 10121), (57, 10211), (62, 10262),

Gene: Tillicus\_15 Start: 10534, Stop: 10923, Start Num: 11  
Candidate Starts for Tillicus\_15:  
(Start: 11 @10534 has 29 MA's), (38, 10744),

Gene: TinyMiny\_18 Start: 9106, Stop: 9462, Start Num: 12  
Candidate Starts for TinyMiny\_18:  
(Start: 12 @9106 has 75 MA's), (14, 9142), (21, 9202), (35, 9301),

Gene: Triscuit\_37 Start: 19392, Stop: 19853, Start Num: 9  
Candidate Starts for Triscuit\_37:  
(Start: 9 @19392 has 2 MA's), (20, 19488), (22, 19518), (28, 19563), (34, 19608), (44, 19689),

Gene: Troll4\_15 Start: 10453, Stop: 10872, Start Num: 12

Candidate Starts for Troll4\_15:

(Start: 12 @10453 has 75 MA's), (19, 10540), (21, 10549), (23, 10576), (24, 10600), (26, 10609), (28, 10615), (35, 10648), (38, 10657), (57, 10834),

Gene: Visconti\_15 Start: 10462, Stop: 10881, Start Num: 12

Candidate Starts for Visconti\_15:

(Start: 12 @10462 has 75 MA's), (19, 10549), (21, 10558), (23, 10585), (24, 10609), (26, 10618), (28, 10624), (35, 10657), (38, 10666), (57, 10843),

Gene: WaldoWhy\_16 Start: 10455, Stop: 10874, Start Num: 12

Candidate Starts for WaldoWhy\_16:

(Start: 12 @10455 has 75 MA's), (19, 10542), (21, 10551), (23, 10578), (24, 10602), (26, 10611), (28, 10617), (35, 10650), (38, 10659), (57, 10836),

Gene: Wojtek\_13 Start: 10861, Stop: 11250, Start Num: 11

Candidate Starts for Wojtek\_13:

(Start: 11 @10861 has 29 MA's), (37, 11068), (38, 11071), (45, 11104),

Gene: Wollypog\_5 Start: 5809, Stop: 6210, Start Num: 12

Candidate Starts for Wollypog\_5:

(Start: 12 @5809 has 75 MA's), (46, 6064), (48, 6082),

Gene: Xenia2\_12 Start: 10903, Stop: 11289, Start Num: 11

Candidate Starts for Xenia2\_12:

(Start: 11 @10903 has 29 MA's), (15, 10957), (20, 10999), (27, 11068), (38, 11113),

Gene: Yikes\_15 Start: 12245, Stop: 12634, Start Num: 11

Candidate Starts for Yikes\_15:

(Start: 11 @12245 has 29 MA's), (25, 12401), (26, 12407), (27, 12410), (38, 12455),

Gene: Zany\_14 Start: 11374, Stop: 11763, Start Num: 11

Candidate Starts for Zany\_14:

(Start: 11 @11374 has 29 MA's), (25, 11530), (26, 11536), (27, 11539), (38, 11584), (60, 11755),