



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 171417 Report

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

Pham number 171417 has 76 members, 8 are drafts.

Phages represented in each track:

- Track 1 : Mercedes\_37
- Track 2 : Jollipop\_82, BrazzalePHS\_80, LittleFortune\_82, PierreOrion\_80, Cranjis\_82, Yeti\_80, Savannah\_80, Piperis\_82, Jefe\_81, Crisis\_82, Kowalski\_80, Honeyfin\_81, Scumberland\_83, Hermeonysus\_81, Shotgun\_80, PiperSansNom\_82, Ramiel05\_80
- Track 3 : Jayden\_81
- Track 4 : Pulchra\_83, KaiHaiDragon\_82, Phrancesco\_81, CrazyRich\_79, Quhwah\_85, EarickHC\_82
- Track 5 : Ariadne\_90, Smarties\_90
- Track 6 : ClearAsMud\_84
- Track 7 : Busephilis\_80, Onika\_80, Selwyn23\_82, Antares\_81
- Track 8 : Ganandorf\_79
- Track 9 : Metamorphoo\_82
- Track 10 : Phorgeous\_81
- Track 11 : NoodlelyBoi\_81
- Track 12 : Paschalis\_81
- Track 13 : NarutoRun\_58, Cybele\_58, PhunaPhoke\_58, Kate\_58, AnnaSerena\_58, Pharpay\_57, Anakin\_58, Krampus\_58, Potty\_57, Poultruss\_58, Rachella\_58, Neptune\_58
- Track 14 : MortySmith\_56, Tedro\_58, Aesir\_57, JDawG\_57, Dauntless\_58, Erudite\_57, Haunter\_58
- Track 15 : JingleBells\_59, FreddieHg\_59, Hiddenleaf\_59, Chivey\_59, DannyDe\_59
- Track 16 : Gilda\_58
- Track 17 : Crestdrop\_60
- Track 18 : Rie18\_58
- Track 19 : Karate\_57
- Track 20 : Hager\_59
- Track 21 : OverHedge\_57
- Track 22 : CoolCookie\_63
- Track 23 : Snakehole\_59
- Track 24 : Kozie\_78
- Track 25 : Margaery\_77
- Track 26 : Cressida\_81
- Track 27 : Terij\_78
- Track 28 : Leaf\_123, Dewdrop\_123
- Track 29 : FuzzBuster\_74

### **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 63 of the 68 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aesir\_57, Anakin\_58, AnnaSerena\_58, Antares\_81, Ariadne\_90, BrazzalePHS\_80, Busephilis\_80, Chivey\_59, ClearAsMud\_84, CoolCookie\_63, Cranjis\_82, CrazyRich\_79, Cressida\_81, Crestdrop\_60, Crisis\_82, Cybele\_58, DannyDe\_59, Dauntless\_58, EarickHC\_82, Erudite\_57, FreddieHg\_59, FuzzBuster\_74, Ganandorf\_79, Gilda\_58, Hager\_59, Haunter\_58, Hermeonysus\_81, Hiddenleaf\_59, Honeyfin\_81, JDawG\_57, Jayden\_81, Jefe\_81, JingleBells\_59, Jollipop\_82, KaiHaiDragon\_82, Karate\_57, Kate\_58, Kowalski\_80, Krampus\_58, LittleFortune\_82, Mercedes\_37, Metamorphoo\_82, MortySmith\_56, NarutoRun\_58, Neptune\_58, NoodlelyBoi\_81, Onika\_80, OverHedge\_57, Paschalis\_81, Pharpay\_57, Phorgeous\_81, Phrancesco\_81, PhunaPhoke\_58, PierreOrion\_80, PiperSansNom\_82, Piperis\_82, Potty\_57, Poultruss\_58, Pulchra\_83, Quhwah\_85, Rachella\_58, Ramiel05\_80, Rie18\_58, Savannah\_80, Scumberland\_83, Selwyn23\_82, Shotgun\_80, Smarties\_90, Snakehole\_59, Tedro\_58, Yeti\_80,

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

- Dewdrop\_123, Leaf\_123, Margaery\_77, Terij\_78,

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

- Kozie\_78,

### **Summary by start number:**

Start 13:

- Found in 2 of 76 ( 2.6% ) of genes in pham
- Manual Annotations of this start: 2 of 68
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Dewdrop\_123 (GC), Leaf\_123 (GC),

Start 14:

- Found in 1 of 76 ( 1.3% ) of genes in pham
- Manual Annotations of this start: 1 of 68
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Margaery\_77 (EI),

Start 15:

- Found in 1 of 76 ( 1.3% ) of genes in pham
- Manual Annotations of this start: 1 of 68
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Terij\_78 (EI),

Start 19:

- Found in 75 of 76 ( 98.7% ) of genes in pham
- Manual Annotations of this start: 63 of 68
- Called 94.7% of time when present

- Phage (with cluster) where this start called: Aesir\_57 (EF), Anakin\_58 (EF), AnnaSerena\_58 (EF), Antares\_81 (EC), Ariadne\_90 (EC), BrazzalePHS\_80 (EC), Busephilis\_80 (EC), Chivey\_59 (EF), ClearAsMud\_84 (EC), CoolCookie\_63 (EF), Cranjis\_82 (EC), CrazyRich\_79 (EC), Cressida\_81 (EI), Crestdrop\_60 (EF), Crisis\_82 (EC), Cybele\_58 (EF), DannyDe\_59 (EF), Dauntless\_58 (EF), EarickHC\_82 (EC), Erudite\_57 (EF), FreddieHg\_59 (EF), FuzzBuster\_74 (singleton), Ganandorf\_79 (EC), Gilda\_58 (EF), Hager\_59 (EF), Haunter\_58 (EF), Hermeonysus\_81 (EC), Hiddenleaf\_59 (EF), Honeyfin\_81 (EC), JDawG\_57 (EF), Jayden\_81 (EC), Jefe\_81 (EC), JingleBells\_59 (EF), Jollipop\_82 (EC), KaiHaiDragon\_82 (EC), Karate\_57 (EF), Kate\_58 (EF), Kowalski\_80 (EC), Krampus\_58 (EF), LittleFortune\_82 (EC), Mercedes\_37 (EA), Metamorphoo\_82 (EC), MortySmith\_56 (EF), NarutoRun\_58 (EF), Neptune\_58 (EF), NoodlelyBoi\_81 (EC), Onika\_80 (EC), OverHedge\_57 (EF), Paschalis\_81 (EC), Pharpay\_57 (EF), Phorgeous\_81 (EC), Phrancesco\_81 (EC), PhunaPhoke\_58 (EF), PierreOrion\_80 (EC), PiperSansNom\_82 (EC), Piperis\_82 (EC), Potty\_57 (EF), Poultruss\_58 (EF), Pulchra\_83 (EC), Quhwah\_85 (EC), Rachella\_58 (EF), Ramiel05\_80 (EC), Rie18\_58 (EF), Savannah\_80 (EC), Scumberland\_83 (EC), Selwyn23\_82 (EC), Shotgun\_80 (EC), Smarties\_90 (EC), Snakehole\_59 (EF), Tedro\_58 (EF), Yeti\_80 (EC),

Start 20:

- Found in 1 of 76 ( 1.3% ) of genes in pham
- Manual Annotations of this start: 1 of 68
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Kozie\_78 (EI),

### **Summary by clusters:**

There are 6 clusters represented in this pham: singleton, EI, EF, EA, EC, GC,

Info for manual annotations of cluster EA:

- Start number 19 was manually annotated 1 time for cluster EA.

Info for manual annotations of cluster EC:

- Start number 19 was manually annotated 34 times for cluster EC.

Info for manual annotations of cluster EF:

- Start number 19 was manually annotated 26 times for cluster EF.

Info for manual annotations of cluster EI:

- Start number 14 was manually annotated 1 time for cluster EI.
- Start number 15 was manually annotated 1 time for cluster EI.
- Start number 19 was manually annotated 1 time for cluster EI.
- Start number 20 was manually annotated 1 time for cluster EI.

Info for manual annotations of cluster GC:

- Start number 13 was manually annotated 2 times for cluster GC.

### **Gene Information:**

Gene: Aesir\_57 Start: 43316, Stop: 44947, Start Num: 19

Candidate Starts for Aesir\_57:

(17, 43265), (Start: 19 @43316 has 63 MA's), (22, 43361), (24, 43391), (35, 43565), (36, 43583), (37, 43601), (46, 43835), (47, 43844), (52, 43901), (58, 43976), (60, 43988), (77, 44375), (82, 44456), (101, 44633), (102, 44642), (108, 44681), (121, 44843), (125, 44921),

Gene: Anakin\_58 Start: 43655, Stop: 45286, Start Num: 19

Candidate Starts for Anakin\_58:

(Start: 19 @43655 has 63 MA's), (22, 43700), (24, 43730), (36, 43922), (37, 43940), (46, 44174), (47, 44183), (52, 44240), (58, 44315), (60, 44327), (82, 44795), (101, 44972), (102, 44981), (108, 45020), (121, 45182), (125, 45260),

Gene: AnnaSerena\_58 Start: 43689, Stop: 45320, Start Num: 19

Candidate Starts for AnnaSerena\_58:

(Start: 19 @43689 has 63 MA's), (22, 43734), (24, 43764), (36, 43956), (37, 43974), (46, 44208), (47, 44217), (52, 44274), (58, 44349), (60, 44361), (82, 44829), (101, 45006), (102, 45015), (108, 45054), (121, 45216), (125, 45294),

Gene: Antares\_81 Start: 47473, Stop: 48798, Start Num: 19

Candidate Starts for Antares\_81:

(Start: 19 @47473 has 63 MA's), (49, 47902), (59, 48016), (61, 48037), (69, 48193), (71, 48208), (75, 48310), (79, 48442), (103, 48694), (107, 48712), (109, 48733), (111, 48754), (112, 48757), (114, 48781),

Gene: Ariadne\_90 Start: 48355, Stop: 49632, Start Num: 19

Candidate Starts for Ariadne\_90:

(Start: 19 @48355 has 63 MA's), (32, 48568), (36, 48607), (46, 48757), (47, 48766), (59, 48898), (61, 48919), (69, 49075), (71, 49090), (73, 49111), (79, 49324), (85, 49387), (99, 49486), (103, 49528), (105, 49537), (107, 49546), (111, 49588), (112, 49591), (114, 49615),

Gene: BrazzalePHS\_80 Start: 47273, Stop: 48598, Start Num: 19

Candidate Starts for BrazzalePHS\_80:

(Start: 19 @47273 has 63 MA's), (49, 47702), (59, 47816), (61, 47837), (69, 47993), (71, 48008), (75, 48110), (79, 48242), (103, 48494), (107, 48512), (109, 48533), (111, 48554), (112, 48557), (114, 48581),

Gene: Busephilis\_80 Start: 47180, Stop: 48505, Start Num: 19

Candidate Starts for Busephilis\_80:

(Start: 19 @47180 has 63 MA's), (49, 47609), (59, 47723), (61, 47744), (69, 47900), (71, 47915), (75, 48017), (79, 48149), (103, 48401), (107, 48419), (109, 48440), (111, 48461), (112, 48464), (114, 48488),

Gene: Chivey\_59 Start: 43119, Stop: 44750, Start Num: 19

Candidate Starts for Chivey\_59:

(17, 43068), (Start: 19 @43119 has 63 MA's), (22, 43164), (24, 43194), (36, 43386), (37, 43404), (46, 43638), (47, 43647), (52, 43704), (58, 43779), (60, 43791), (77, 44178), (82, 44259), (101, 44436), (102, 44445), (108, 44484), (121, 44646), (125, 44724),

Gene: ClearAsMud\_84 Start: 47498, Stop: 48823, Start Num: 19

Candidate Starts for ClearAsMud\_84:

(Start: 19 @47498 has 63 MA's), (38, 47768), (49, 47927), (51, 47957), (54, 47975), (61, 48062), (68, 48206), (69, 48218), (71, 48233), (75, 48335), (79, 48467), (103, 48719), (107, 48737), (109, 48758), (111, 48779), (112, 48782), (114, 48806),

Gene: CoolCookie\_63 Start: 43699, Stop: 45330, Start Num: 19

Candidate Starts for CoolCookie\_63:

(17, 43648), (Start: 19 @43699 has 63 MA's), (22, 43744), (24, 43774), (35, 43948), (36, 43966), (46, 44218), (47, 44227), (52, 44284), (58, 44359), (60, 44371), (77, 44758), (82, 44839), (101, 45016), (102, 45025), (108, 45064), (121, 45226), (125, 45304),

Gene: Cranjjs\_82 Start: 47460, Stop: 48785, Start Num: 19

Candidate Starts for Cranjjs\_82:

(Start: 19 @47460 has 63 MA's), (49, 47889), (59, 48003), (61, 48024), (69, 48180), (71, 48195), (75, 48297), (79, 48429), (103, 48681), (107, 48699), (109, 48720), (111, 48741), (112, 48744), (114, 48768),

Gene: CrazyRich\_79 Start: 46970, Stop: 48295, Start Num: 19

Candidate Starts for CrazyRich\_79:

(Start: 19 @46970 has 63 MA's), (49, 47399), (59, 47513), (61, 47534), (66, 47633), (69, 47690), (71, 47705), (75, 47807), (79, 47939), (103, 48191), (107, 48209), (109, 48230), (111, 48251), (112, 48254), (114, 48278),

Gene: Cressida\_81 Start: 48489, Stop: 49766, Start Num: 19

Candidate Starts for Cressida\_81:

(Start: 19 @48489 has 63 MA's), (23, 48546), (26, 48624), (29, 48681), (36, 48747), (39, 48771), (50, 48939), (51, 48948), (52, 48957), (59, 49032), (60, 49038), (61, 49053), (69, 49209), (71, 49224), (76, 49365), (93, 49593), (98, 49620), (104, 49668),

Gene: Crestdrop\_60 Start: 43390, Stop: 45021, Start Num: 19

Candidate Starts for Crestdrop\_60:

(17, 43339), (Start: 19 @43390 has 63 MA's), (22, 43435), (35, 43639), (36, 43657), (37, 43675), (46, 43909), (47, 43918), (52, 43975), (58, 44050), (60, 44062), (77, 44449), (82, 44530), (101, 44707), (102, 44716), (108, 44755), (121, 44917), (122, 44929), (125, 44995),

Gene: Crisis\_82 Start: 47416, Stop: 48741, Start Num: 19

Candidate Starts for Crisis\_82:

(Start: 19 @47416 has 63 MA's), (49, 47845), (59, 47959), (61, 47980), (69, 48136), (71, 48151), (75, 48253), (79, 48385), (103, 48637), (107, 48655), (109, 48676), (111, 48697), (112, 48700), (114, 48724),

Gene: Cybele\_58 Start: 43673, Stop: 45316, Start Num: 19

Candidate Starts for Cybele\_58:

(Start: 19 @43673 has 63 MA's), (22, 43718), (24, 43748), (36, 43940), (37, 43958), (46, 44192), (47, 44201), (52, 44258), (58, 44333), (60, 44345), (82, 44813), (101, 44990), (102, 44999), (108, 45038), (121, 45212), (125, 45290),

Gene: DannyDe\_59 Start: 43120, Stop: 44751, Start Num: 19

Candidate Starts for DannyDe\_59:

(17, 43069), (Start: 19 @43120 has 63 MA's), (22, 43165), (24, 43195), (36, 43387), (37, 43405), (46, 43639), (47, 43648), (52, 43705), (58, 43780), (60, 43792), (77, 44179), (82, 44260), (101, 44437), (102, 44446), (108, 44485), (121, 44647), (125, 44725),

Gene: Dauntless\_58 Start: 43251, Stop: 44882, Start Num: 19

Candidate Starts for Dauntless\_58:

(17, 43200), (Start: 19 @43251 has 63 MA's), (22, 43296), (24, 43326), (35, 43500), (36, 43518), (37, 43536), (46, 43770), (47, 43779), (52, 43836), (58, 43911), (60, 43923), (77, 44310), (82, 44391), (101, 44568), (102, 44577), (108, 44616), (121, 44778), (125, 44856),

Gene: Dewdrop\_123 Start: 75555, Stop: 77261, Start Num: 13

Candidate Starts for Dewdrop\_123:

(12, 75549), (Start: 13 @75555 has 2 MA's), (Start: 19 @75639 has 63 MA's), (29, 75849), (40, 75960), (48, 76164), (50, 76194), (51, 76203), (56, 76260), (57, 76269), (62, 76332), (63, 76398), (69, 76494), (71, 76509), (79, 76743), (83, 76800), (87, 76818), (91, 76893), (107, 77016), (113, 77100), (117, 77154), (119, 77190),

Gene: EarickHC\_82 Start: 47338, Stop: 48663, Start Num: 19

Candidate Starts for EarickHC\_82:

(Start: 19 @47338 has 63 MA's), (49, 47767), (59, 47881), (61, 47902), (66, 48001), (69, 48058), (71, 48073), (75, 48175), (79, 48307), (103, 48559), (107, 48577), (109, 48598), (111, 48619), (112, 48622), (114, 48646),

Gene: Erudite\_57 Start: 43251, Stop: 44882, Start Num: 19

Candidate Starts for Erudite\_57:

(17, 43200), (Start: 19 @43251 has 63 MA's), (22, 43296), (24, 43326), (35, 43500), (36, 43518), (37, 43536), (46, 43770), (47, 43779), (52, 43836), (58, 43911), (60, 43923), (77, 44310), (82, 44391), (101, 44568), (102, 44577), (108, 44616), (121, 44778), (125, 44856),

Gene: FreddieHg\_59 Start: 43136, Stop: 44767, Start Num: 19

Candidate Starts for FreddieHg\_59:

(17, 43085), (Start: 19 @43136 has 63 MA's), (22, 43181), (24, 43211), (36, 43403), (37, 43421), (46, 43655), (47, 43664), (52, 43721), (58, 43796), (60, 43808), (77, 44195), (82, 44276), (101, 44453), (102, 44462), (108, 44501), (121, 44663), (125, 44741),

Gene: FuzzBuster\_74 Start: 44531, Stop: 43062, Start Num: 19

Candidate Starts for FuzzBuster\_74:

(Start: 19 @44531 has 63 MA's), (29, 44333), (36, 44267), (41, 44237), (50, 44054), (55, 44006), (56, 43988), (58, 43961), (63, 43856), (70, 43766), (74, 43661), (81, 43505), (86, 43466), (90, 43388), (96, 43349), (102, 43298), (116, 43139), (118, 43109),

Gene: Ganandorf\_79 Start: 46824, Stop: 48149, Start Num: 19

Candidate Starts for Ganandorf\_79:

(Start: 19 @46824 has 63 MA's), (49, 47253), (59, 47367), (61, 47388), (66, 47487), (69, 47544), (71, 47559), (75, 47661), (79, 47793), (107, 48063), (109, 48084), (111, 48105), (112, 48108), (114, 48132),

Gene: Gilda\_58 Start: 43677, Stop: 45308, Start Num: 19

Candidate Starts for Gilda\_58:

(Start: 19 @43677 has 63 MA's), (22, 43722), (24, 43752), (36, 43944), (37, 43962), (46, 44196), (47, 44205), (52, 44262), (58, 44337), (60, 44349), (82, 44817), (101, 44994), (102, 45003), (108, 45042), (121, 45204), (125, 45282),

Gene: Hager\_59 Start: 43064, Stop: 44692, Start Num: 19

Candidate Starts for Hager\_59:

(Start: 19 @43064 has 63 MA's), (22, 43109), (37, 43349), (46, 43583), (47, 43592), (52, 43649), (59, 43730), (60, 43736), (77, 44123), (82, 44204), (102, 44390), (108, 44429), (121, 44585),

Gene: Haunter\_58 Start: 42889, Stop: 44520, Start Num: 19

Candidate Starts for Haunter\_58:

(17, 42838), (Start: 19 @42889 has 63 MA's), (22, 42934), (24, 42964), (35, 43138), (36, 43156), (37, 43174), (46, 43408), (47, 43417), (52, 43474), (58, 43549), (60, 43561), (77, 43948), (82, 44029), (101, 44206), (102, 44215), (108, 44254), (121, 44416), (125, 44494),

Gene: Hermeonysus\_81 Start: 47181, Stop: 48506, Start Num: 19

Candidate Starts for Hermeonysus\_81:

(Start: 19 @47181 has 63 MA's), (49, 47610), (59, 47724), (61, 47745), (69, 47901), (71, 47916), (75, 48018), (79, 48150), (103, 48402), (107, 48420), (109, 48441), (111, 48462), (112, 48465), (114, 48489),

Gene: Hiddenleaf\_59 Start: 43119, Stop: 44750, Start Num: 19

Candidate Starts for Hiddenleaf\_59:

(17, 43068), (Start: 19 @43119 has 63 MA's), (22, 43164), (24, 43194), (36, 43386), (37, 43404), (46, 43638), (47, 43647), (52, 43704), (58, 43779), (60, 43791), (77, 44178), (82, 44259), (101, 44436), (102, 44445), (108, 44484), (121, 44646), (125, 44724),

Gene: Honeyfin\_81 Start: 47014, Stop: 48339, Start Num: 19

Candidate Starts for Honeyfin\_81:

(Start: 19 @47014 has 63 MA's), (49, 47443), (59, 47557), (61, 47578), (69, 47734), (71, 47749), (75, 47851), (79, 47983), (103, 48235), (107, 48253), (109, 48274), (111, 48295), (112, 48298), (114, 48322),

Gene: JDawG\_57 Start: 43311, Stop: 44942, Start Num: 19

Candidate Starts for JDawG\_57:

(17, 43260), (Start: 19 @43311 has 63 MA's), (22, 43356), (24, 43386), (35, 43560), (36, 43578), (37, 43596), (46, 43830), (47, 43839), (52, 43896), (58, 43971), (60, 43983), (77, 44370), (82, 44451), (101, 44628), (102, 44637), (108, 44676), (121, 44838), (125, 44916),

Gene: Jayden\_81 Start: 46981, Stop: 48267, Start Num: 19

Candidate Starts for Jayden\_81:

(Start: 19 @46981 has 63 MA's), (38, 47251), (50, 47434), (51, 47443), (67, 47671), (69, 47701), (78, 47941), (79, 47950), (85, 48013), (100, 48121), (103, 48163), (105, 48172), (112, 48226), (114, 48250),

Gene: Jefe\_81 Start: 47236, Stop: 48561, Start Num: 19

Candidate Starts for Jefe\_81:

(Start: 19 @47236 has 63 MA's), (49, 47665), (59, 47779), (61, 47800), (69, 47956), (71, 47971), (75, 48073), (79, 48205), (103, 48457), (107, 48475), (109, 48496), (111, 48517), (112, 48520), (114, 48544),

Gene: JingleBells\_59 Start: 43225, Stop: 44856, Start Num: 19

Candidate Starts for JingleBells\_59:

(17, 43174), (Start: 19 @43225 has 63 MA's), (22, 43270), (24, 43300), (36, 43492), (37, 43510), (46, 43744), (47, 43753), (52, 43810), (58, 43885), (60, 43897), (77, 44284), (82, 44365), (101, 44542), (102, 44551), (108, 44590), (121, 44752), (125, 44830),

Gene: Jollipop\_82 Start: 47601, Stop: 48926, Start Num: 19

Candidate Starts for Jollipop\_82:

(Start: 19 @47601 has 63 MA's), (49, 48030), (59, 48144), (61, 48165), (69, 48321), (71, 48336), (75, 48438), (79, 48570), (103, 48822), (107, 48840), (109, 48861), (111, 48882), (112, 48885), (114, 48909),

Gene: KaiHaiDragon\_82 Start: 47338, Stop: 48663, Start Num: 19

Candidate Starts for KaiHaiDragon\_82:

(Start: 19 @47338 has 63 MA's), (49, 47767), (59, 47881), (61, 47902), (66, 48001), (69, 48058), (71, 48073), (75, 48175), (79, 48307), (103, 48559), (107, 48577), (109, 48598), (111, 48619), (112,



48622), (114, 48646),

Gene: Karate\_57 Start: 43493, Stop: 45124, Start Num: 19

Candidate Starts for Karate\_57:

(Start: 19 @43493 has 63 MA's), (22, 43538), (24, 43568), (35, 43742), (36, 43760), (37, 43778), (46, 44012), (47, 44021), (52, 44078), (58, 44153), (60, 44165), (82, 44633), (94, 44753), (101, 44810), (102, 44819), (108, 44858), (121, 45020), (125, 45098),

Gene: Kate\_58 Start: 43594, Stop: 45225, Start Num: 19

Candidate Starts for Kate\_58:

(Start: 19 @43594 has 63 MA's), (22, 43639), (24, 43669), (36, 43861), (37, 43879), (46, 44113), (47, 44122), (52, 44179), (58, 44254), (60, 44266), (82, 44734), (101, 44911), (102, 44920), (108, 44959), (121, 45121), (125, 45199),

Gene: Kowalski\_80 Start: 47268, Stop: 48593, Start Num: 19

Candidate Starts for Kowalski\_80:

(Start: 19 @47268 has 63 MA's), (49, 47697), (59, 47811), (61, 47832), (69, 47988), (71, 48003), (75, 48105), (79, 48237), (103, 48489), (107, 48507), (109, 48528), (111, 48549), (112, 48552), (114, 48576),

Gene: Kozie\_78 Start: 48031, Stop: 49293, Start Num: 20

Candidate Starts for Kozie\_78:

(Start: 20 @48031 has 1 MA's), (27, 48199), (31, 48241), (33, 48256), (43, 48367), (53, 48505), (65, 48679), (69, 48751), (72, 48769), (80, 49009), (88, 49087),

Gene: Krampus\_58 Start: 43690, Stop: 45321, Start Num: 19

Candidate Starts for Krampus\_58:

(Start: 19 @43690 has 63 MA's), (22, 43735), (24, 43765), (36, 43957), (37, 43975), (46, 44209), (47, 44218), (52, 44275), (58, 44350), (60, 44362), (82, 44830), (101, 45007), (102, 45016), (108, 45055), (121, 45217), (125, 45295),

Gene: Leaf\_123 Start: 75555, Stop: 77261, Start Num: 13

Candidate Starts for Leaf\_123:

(12, 75549), (Start: 13 @75555 has 2 MA's), (Start: 19 @75639 has 63 MA's), (29, 75849), (40, 75960), (48, 76164), (50, 76194), (51, 76203), (56, 76260), (57, 76269), (62, 76332), (63, 76398), (69, 76494), (71, 76509), (79, 76743), (83, 76800), (87, 76818), (91, 76893), (107, 77016), (113, 77100), (117, 77154), (119, 77190),

Gene: LittleFortune\_82 Start: 47257, Stop: 48582, Start Num: 19

Candidate Starts for LittleFortune\_82:

(Start: 19 @47257 has 63 MA's), (49, 47686), (59, 47800), (61, 47821), (69, 47977), (71, 47992), (75, 48094), (79, 48226), (103, 48478), (107, 48496), (109, 48517), (111, 48538), (112, 48541), (114, 48565),

Gene: Margaery\_77 Start: 47888, Stop: 49243, Start Num: 14

Candidate Starts for Margaery\_77:

(1, 47039), (2, 47486), (4, 47696), (5, 47732), (6, 47750), (7, 47762), (10, 47858), (Start: 14 @47888 has 1 MA's), (Start: 19 @47963 has 63 MA's), (23, 48017), (35, 48200), (36, 48218), (39, 48242), (44, 48341), (59, 48503), (60, 48509), (64, 48608), (71, 48695), (76, 48836), (79, 48929), (82, 48980), (86, 48998), (89, 49049), (104, 49145),

Gene: Mercedes\_37 Start: 29517, Stop: 28231, Start Num: 19

Candidate Starts for Mercedes\_37:

(8, 29709), (9, 29640), (11, 29616), (16, 29577), (18, 29559), (Start: 19 @29517 has 63 MA's), (21, 29475), (25, 29394), (28, 29328), (51, 29061), (77, 28593), (79, 28563), (82, 28512), (92, 28419), (95, 28401), (97, 28383), (111, 28266), (114, 28239),

Gene: Metamorphoo\_82 Start: 48066, Stop: 49349, Start Num: 19

Candidate Starts for Metamorphoo\_82:

(Start: 19 @48066 has 63 MA's), (35, 48300), (45, 48456), (51, 48525), (54, 48543), (59, 48609), (75, 48903), (78, 49026), (84, 49095), (96, 49185), (103, 49245), (107, 49263), (112, 49308), (114, 49332),

Gene: MortySmith\_56 Start: 42725, Stop: 44356, Start Num: 19

Candidate Starts for MortySmith\_56:

(17, 42674), (Start: 19 @42725 has 63 MA's), (22, 42770), (24, 42800), (35, 42974), (36, 42992), (37, 43010), (46, 43244), (47, 43253), (52, 43310), (58, 43385), (60, 43397), (77, 43784), (82, 43865), (101, 44042), (102, 44051), (108, 44090), (121, 44252), (125, 44330),

Gene: NarutoRun\_58 Start: 43655, Stop: 45286, Start Num: 19

Candidate Starts for NarutoRun\_58:

(Start: 19 @43655 has 63 MA's), (22, 43700), (24, 43730), (36, 43922), (37, 43940), (46, 44174), (47, 44183), (52, 44240), (58, 44315), (60, 44327), (82, 44795), (101, 44972), (102, 44981), (108, 45020), (121, 45182), (125, 45260),

Gene: Neptune\_58 Start: 43673, Stop: 45316, Start Num: 19

Candidate Starts for Neptune\_58:

(Start: 19 @43673 has 63 MA's), (22, 43718), (24, 43748), (36, 43940), (37, 43958), (46, 44192), (47, 44201), (52, 44258), (58, 44333), (60, 44345), (82, 44813), (101, 44990), (102, 44999), (108, 45038), (121, 45212), (125, 45290),

Gene: NoodlelyBoi\_81 Start: 47603, Stop: 48928, Start Num: 19

Candidate Starts for NoodlelyBoi\_81:

(Start: 19 @47603 has 63 MA's), (49, 48032), (59, 48146), (61, 48167), (69, 48323), (71, 48338), (75, 48440), (79, 48572), (103, 48824), (107, 48842), (109, 48863), (111, 48884), (112, 48887), (114, 48911),

Gene: Onika\_80 Start: 47239, Stop: 48564, Start Num: 19

Candidate Starts for Onika\_80:

(Start: 19 @47239 has 63 MA's), (49, 47668), (59, 47782), (61, 47803), (69, 47959), (71, 47974), (75, 48076), (79, 48208), (103, 48460), (107, 48478), (109, 48499), (111, 48520), (112, 48523), (114, 48547),

Gene: OverHedge\_57 Start: 43551, Stop: 45182, Start Num: 19

Candidate Starts for OverHedge\_57:

(17, 43500), (Start: 19 @43551 has 63 MA's), (22, 43596), (24, 43626), (36, 43818), (37, 43836), (42, 43917), (46, 44070), (47, 44079), (52, 44136), (58, 44211), (60, 44223), (82, 44691), (101, 44868), (102, 44877), (108, 44916), (115, 45021), (121, 45078), (125, 45156),

Gene: Paschalis\_81 Start: 47266, Stop: 48591, Start Num: 19

Candidate Starts for Paschalis\_81:

(Start: 19 @47266 has 63 MA's), (35, 47500), (49, 47695), (59, 47809), (61, 47830), (69, 47986), (71, 48001), (75, 48103), (79, 48235), (103, 48487), (107, 48505), (109, 48526), (111, 48547), (112, 48550), (114, 48574),

Gene: Pharpay\_57 Start: 43700, Stop: 45331, Start Num: 19

Candidate Starts for Pharpay\_57:

(Start: 19 @43700 has 63 MA's), (22, 43745), (24, 43775), (36, 43967), (37, 43985), (46, 44219), (47, 44228), (52, 44285), (58, 44360), (60, 44372), (82, 44840), (101, 45017), (102, 45026), (108, 45065), (121, 45227), (125, 45305),

Gene: Phorgeous\_81 Start: 47055, Stop: 48380, Start Num: 19

Candidate Starts for Phorgeous\_81:

(Start: 19 @47055 has 63 MA's), (49, 47484), (59, 47598), (61, 47619), (64, 47703), (69, 47775), (71, 47790), (75, 47892), (79, 48024), (103, 48276), (107, 48294), (109, 48315), (111, 48336), (112, 48339), (114, 48363),

Gene: Phrancesco\_81 Start: 47366, Stop: 48691, Start Num: 19

Candidate Starts for Phrancesco\_81:

(Start: 19 @47366 has 63 MA's), (49, 47795), (59, 47909), (61, 47930), (66, 48029), (69, 48086), (71, 48101), (75, 48203), (79, 48335), (103, 48587), (107, 48605), (109, 48626), (111, 48647), (112, 48650), (114, 48674),

Gene: PhunaPhoke\_58 Start: 43670, Stop: 45301, Start Num: 19

Candidate Starts for PhunaPhoke\_58:

(Start: 19 @43670 has 63 MA's), (22, 43715), (24, 43745), (36, 43937), (37, 43955), (46, 44189), (47, 44198), (52, 44255), (58, 44330), (60, 44342), (82, 44810), (101, 44987), (102, 44996), (108, 45035), (121, 45197), (125, 45275),

Gene: PierreOrion\_80 Start: 47075, Stop: 48400, Start Num: 19

Candidate Starts for PierreOrion\_80:

(Start: 19 @47075 has 63 MA's), (49, 47504), (59, 47618), (61, 47639), (69, 47795), (71, 47810), (75, 47912), (79, 48044), (103, 48296), (107, 48314), (109, 48335), (111, 48356), (112, 48359), (114, 48383),

Gene: PiperSansNom\_82 Start: 47575, Stop: 48900, Start Num: 19

Candidate Starts for PiperSansNom\_82:

(Start: 19 @47575 has 63 MA's), (49, 48004), (59, 48118), (61, 48139), (69, 48295), (71, 48310), (75, 48412), (79, 48544), (103, 48796), (107, 48814), (109, 48835), (111, 48856), (112, 48859), (114, 48883),

Gene: Piperis\_82 Start: 47174, Stop: 48499, Start Num: 19

Candidate Starts for Piperis\_82:

(Start: 19 @47174 has 63 MA's), (49, 47603), (59, 47717), (61, 47738), (69, 47894), (71, 47909), (75, 48011), (79, 48143), (103, 48395), (107, 48413), (109, 48434), (111, 48455), (112, 48458), (114, 48482),

Gene: Potty\_57 Start: 43600, Stop: 45231, Start Num: 19

Candidate Starts for Potty\_57:

(Start: 19 @43600 has 63 MA's), (22, 43645), (24, 43675), (36, 43867), (37, 43885), (46, 44119), (47, 44128), (52, 44185), (58, 44260), (60, 44272), (82, 44740), (101, 44917), (102, 44926), (108, 44965), (121, 45127), (125, 45205),

Gene: Poultruss\_58 Start: 43897, Stop: 45528, Start Num: 19

Candidate Starts for Poultruss\_58:

(Start: 19 @43897 has 63 MA's), (22, 43942), (24, 43972), (36, 44164), (37, 44182), (46, 44416), (47, 44425), (52, 44482), (58, 44557), (60, 44569), (82, 45037), (101, 45214), (102, 45223), (108, 45262), (121, 45424), (125, 45502),

Gene: Pulchra\_83 Start: 47741, Stop: 49066, Start Num: 19

Candidate Starts for Pulchra\_83:

(Start: 19 @47741 has 63 MA's), (49, 48170), (59, 48284), (61, 48305), (66, 48404), (69, 48461), (71, 48476), (75, 48578), (79, 48710), (103, 48962), (107, 48980), (109, 49001), (111, 49022), (112, 49025), (114, 49049),

Gene: Quhwah\_85 Start: 47895, Stop: 49220, Start Num: 19

Candidate Starts for Quhwah\_85:

(Start: 19 @47895 has 63 MA's), (49, 48324), (59, 48438), (61, 48459), (66, 48558), (69, 48615), (71, 48630), (75, 48732), (79, 48864), (103, 49116), (107, 49134), (109, 49155), (111, 49176), (112, 49179), (114, 49203),

Gene: Rachella\_58 Start: 43681, Stop: 45312, Start Num: 19

Candidate Starts for Rachella\_58:

(Start: 19 @43681 has 63 MA's), (22, 43726), (24, 43756), (36, 43948), (37, 43966), (46, 44200), (47, 44209), (52, 44266), (58, 44341), (60, 44353), (82, 44821), (101, 44998), (102, 45007), (108, 45046), (121, 45208), (125, 45286),

Gene: Ramiel05\_80 Start: 47268, Stop: 48593, Start Num: 19

Candidate Starts for Ramiel05\_80:

(Start: 19 @47268 has 63 MA's), (49, 47697), (59, 47811), (61, 47832), (69, 47988), (71, 48003), (75, 48105), (79, 48237), (103, 48489), (107, 48507), (109, 48528), (111, 48549), (112, 48552), (114, 48576),

Gene: Rie18\_58 Start: 43470, Stop: 45098, Start Num: 19

Candidate Starts for Rie18\_58:

(Start: 19 @43470 has 63 MA's), (22, 43515), (37, 43755), (46, 43989), (47, 43998), (52, 44055), (59, 44136), (82, 44610), (102, 44796), (108, 44835), (122, 45006),

Gene: Savannah\_80 Start: 47460, Stop: 48785, Start Num: 19

Candidate Starts for Savannah\_80:

(Start: 19 @47460 has 63 MA's), (49, 47889), (59, 48003), (61, 48024), (69, 48180), (71, 48195), (75, 48297), (79, 48429), (103, 48681), (107, 48699), (109, 48720), (111, 48741), (112, 48744), (114, 48768),

Gene: Scumberland\_83 Start: 47514, Stop: 48839, Start Num: 19

Candidate Starts for Scumberland\_83:

(Start: 19 @47514 has 63 MA's), (49, 47943), (59, 48057), (61, 48078), (69, 48234), (71, 48249), (75, 48351), (79, 48483), (103, 48735), (107, 48753), (109, 48774), (111, 48795), (112, 48798), (114, 48822),

Gene: Selwyn23\_82 Start: 47399, Stop: 48724, Start Num: 19

Candidate Starts for Selwyn23\_82:

(Start: 19 @47399 has 63 MA's), (49, 47828), (59, 47942), (61, 47963), (69, 48119), (71, 48134), (75, 48236), (79, 48368), (103, 48620), (107, 48638), (109, 48659), (111, 48680), (112, 48683), (114, 48707),

Gene: Shotgun\_80 Start: 46770, Stop: 48095, Start Num: 19

Candidate Starts for Shotgun\_80:

(Start: 19 @46770 has 63 MA's), (49, 47199), (59, 47313), (61, 47334), (69, 47490), (71, 47505), (75, 47607), (79, 47739), (103, 47991), (107, 48009), (109, 48030), (111, 48051), (112, 48054), (114, 48078),

Gene: Smarties\_90 Start: 48352, Stop: 49629, Start Num: 19

Candidate Starts for Smarties\_90:

(Start: 19 @48352 has 63 MA's), (32, 48565), (36, 48604), (46, 48754), (47, 48763), (59, 48895), (61, 48916), (69, 49072), (71, 49087), (73, 49108), (79, 49321), (85, 49384), (99, 49483), (103, 49525), (105, 49534), (107, 49543), (111, 49585), (112, 49588), (114, 49612),

Gene: Snakehole\_59 Start: 43097, Stop: 44728, Start Num: 19

Candidate Starts for Snakehole\_59:

(17, 43046), (Start: 19 @43097 has 63 MA's), (22, 43142), (24, 43172), (36, 43364), (37, 43382), (46, 43616), (47, 43625), (52, 43682), (58, 43757), (60, 43769), (82, 44237), (101, 44414), (102, 44423), (108, 44462), (121, 44624), (125, 44702),

Gene: Tedro\_58 Start: 43107, Stop: 44738, Start Num: 19

Candidate Starts for Tedro\_58:

(17, 43056), (Start: 19 @43107 has 63 MA's), (22, 43152), (24, 43182), (35, 43356), (36, 43374), (37, 43392), (46, 43626), (47, 43635), (52, 43692), (58, 43767), (60, 43779), (77, 44166), (82, 44247), (101, 44424), (102, 44433), (108, 44472), (121, 44634), (125, 44712),

Gene: Terij\_78 Start: 47347, Stop: 48885, Start Num: 15

Candidate Starts for Terij\_78:

(1, 46399), (3, 46915), (Start: 15 @47347 has 1 MA's), (Start: 19 @47410 has 63 MA's), (23, 47464), (30, 47608), (34, 47641), (59, 47956), (60, 47962), (71, 48148), (79, 48382), (82, 48433), (83, 48439), (89, 48514), (106, 48619), (110, 48655), (115, 48742), (120, 48787), (123, 48823), (124, 48844),

Gene: Yeti\_80 Start: 46796, Stop: 48121, Start Num: 19

Candidate Starts for Yeti\_80:

(Start: 19 @46796 has 63 MA's), (49, 47225), (59, 47339), (61, 47360), (69, 47516), (71, 47531), (75, 47633), (79, 47765), (103, 48017), (107, 48035), (109, 48056), (111, 48077), (112, 48080), (114, 48104),