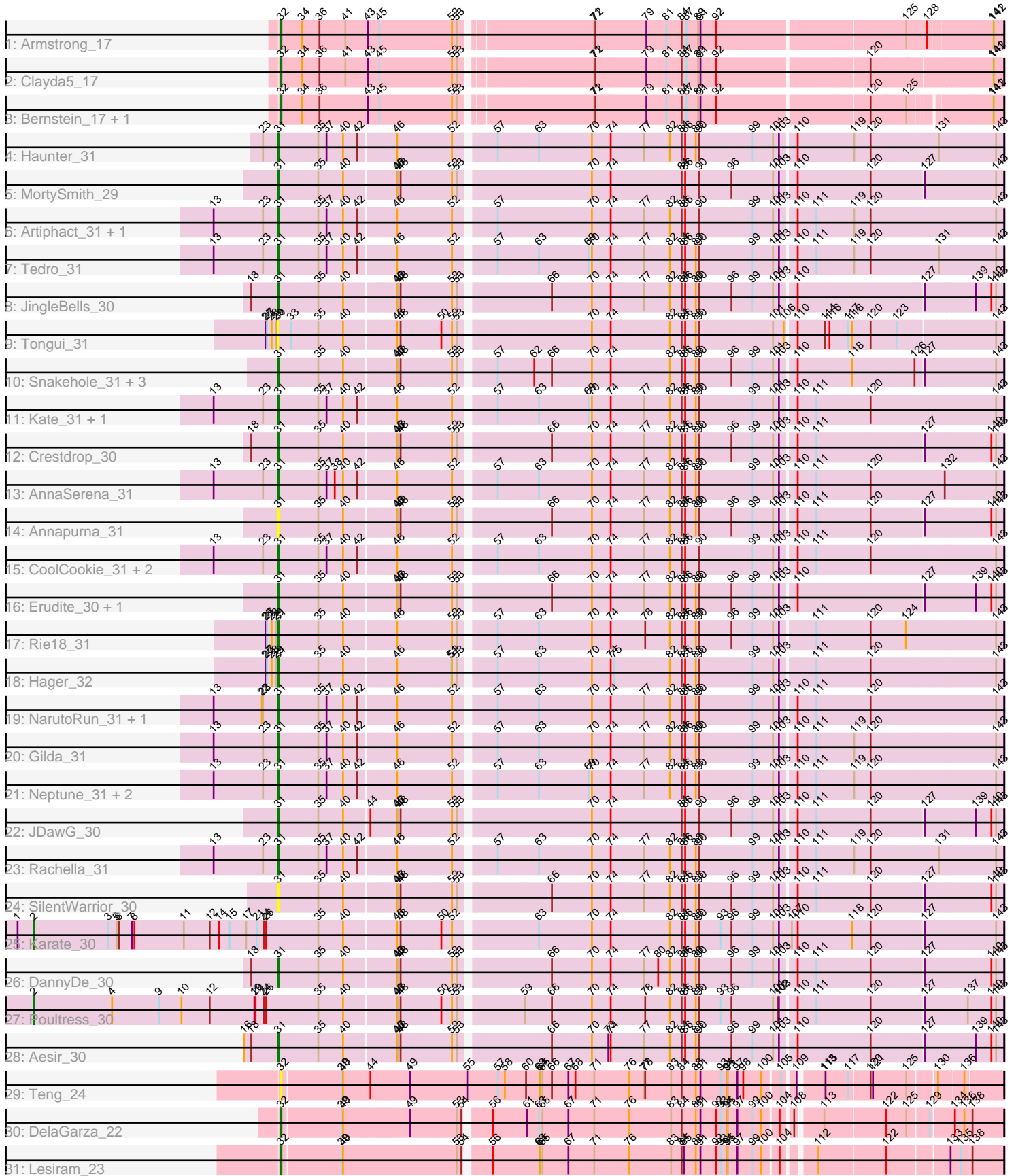


Pham 216309



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 216309 Report

This analysis was run 02/22/25 on database version 588.

Pham number 216309 has 43 members, 6 are drafts.

Phages represented in each track:

- Track 1 : Armstrong\_17
- Track 2 : Clayda5\_17
- Track 3 : Bernstein\_17, Rollins\_17
- Track 4 : Haunter\_31
- Track 5 : MortySmith\_29
- Track 6 : Artiphact\_31, Pharpay\_31
- Track 7 : Tedro\_31
- Track 8 : JingleBells\_30
- Track 9 : Tongui\_31
- Track 10 : Snakehole\_31, Chivey\_30, Hiddenleaf\_30, FreddieHg\_30
- Track 11 : Kate\_31, OverHedge\_31
- Track 12 : Crestdrop\_30
- Track 13 : AnnaSerena\_31
- Track 14 : Annapurna\_31
- Track 15 : CoolCookie\_31, Potty\_31, Krampus\_31
- Track 16 : Erudite\_30, Dauntless\_30
- Track 17 : Rie18\_31
- Track 18 : Hager\_32
- Track 19 : NarutoRun\_31, Anakin\_31
- Track 20 : Gilda\_31
- Track 21 : Neptune\_31, PhunaPhoke\_31, Cybele\_31
- Track 22 : JDawG\_30
- Track 23 : Rachella\_31
- Track 24 : SilentWarrior\_30
- Track 25 : Karate\_30
- Track 26 : DannyDe\_30
- Track 27 : Poultruss\_30
- Track 28 : Aesir\_30
- Track 29 : Teng\_24
- Track 30 : DelaGarza\_22
- Track 31 : Lesiram\_23

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

The start number called the most often in the published annotations is 31, it was called in 29 of the 37 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aesir\_30, Anakin\_31, AnnaSerena\_31, Annapurna\_31, Artiphact\_31, Chivey\_30, CoolCookie\_31, Crestdrop\_30, Cybele\_31, DannyDe\_30, Dauntless\_30, Erudite\_30, FreddieHg\_30, Gilda\_31, Hager\_32, Haunter\_31, Hiddenleaf\_30, JDawG\_30, JingleBells\_30, Kate\_31, Krampus\_31, MortySmith\_29, NarutoRun\_31, Neptune\_31, OverHedge\_31, Pharpay\_31, PhunaPhoke\_31, Potty\_31, Rachella\_31, Rie18\_31, SilentWarrior\_30, Snakehole\_31, Tedro\_31,

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

- 

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

- Armstrong\_17, Bernstein\_17, Clayda5\_17, DelaGarza\_22, Karate\_30, Lesiram\_23, Poultruss\_30, Rollins\_17, Teng\_24, Tongui\_31,

### Summary by start number:

Start 2:

- Found in 2 of 43 ( 4.7% ) of genes in pham
- Manual Annotations of this start: 2 of 37
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Karate\_30 (EF), Poultruss\_30 (EF),

Start 30:

- Found in 1 of 43 ( 2.3% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Tongui\_31 (EF),

Start 31:

- Found in 33 of 43 ( 76.7% ) of genes in pham
- Manual Annotations of this start: 29 of 37
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aesir\_30 (EF), Anakin\_31 (EF), AnnaSerena\_31 (EF), Annapurna\_31 (EF), Artiphact\_31 (EF), Chivey\_30 (EF), CoolCookie\_31 (EF), Crestdrop\_30 (EF), Cybele\_31 (EF), DannyDe\_30 (EF), Dauntless\_30 (EF), Erudite\_30 (EF), FreddieHg\_30 (EF), Gilda\_31 (EF), Hager\_32 (EF), Haunter\_31 (EF), Hiddenleaf\_30 (EF), JDawG\_30 (EF), JingleBells\_30 (EF), Kate\_31 (EF), Krampus\_31 (EF), MortySmith\_29 (EF), NarutoRun\_31 (EF), Neptune\_31 (EF), OverHedge\_31 (EF), Pharpay\_31 (EF), PhunaPhoke\_31 (EF), Potty\_31 (EF), Rachella\_31 (EF), Rie18\_31 (EF), SilentWarrior\_30 (EF), Snakehole\_31 (EF), Tedro\_31 (EF),

Start 32:

- Found in 7 of 43 ( 16.3% ) of genes in pham
- Manual Annotations of this start: 6 of 37
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Armstrong\_17 (EB), Bernstein\_17 (EB), Clayda5\_17 (EB), DelaGarza\_22 (GF), Lesiram\_23 (GF), Rollins\_17 (EB), Teng\_24 (GF),

## Summary by clusters:

There are 3 clusters represented in this pham: GF, EF, EB,

Info for manual annotations of cluster EB:

- Start number 32 was manually annotated 4 times for cluster EB.

Info for manual annotations of cluster EF:

- Start number 2 was manually annotated 2 times for cluster EF.
- Start number 31 was manually annotated 29 times for cluster EF.

Info for manual annotations of cluster GF:

- Start number 32 was manually annotated 2 times for cluster GF.

## Gene Information:

Gene: Aesir\_30 Start: 18424, Stop: 20193, Start Num: 31

Candidate Starts for Aesir\_30:

(16, 18337), (18, 18355), (Start: 31 @18424 has 29 MA's), (35, 18526), (40, 18589), (46, 18712), (47, 18715), (48, 18721), (52, 18850), (53, 18862), (66, 19075), (70, 19177), (73, 19219), (74, 19225), (77, 19306), (82, 19372), (84, 19402), (86, 19411), (88, 19438), (90, 19447), (96, 19528), (99, 19582), (101, 19633), (103, 19648), (110, 19684), (120, 19867), (127, 19996), (139, 20122), (140, 20161), (143, 20173),

Gene: Anakin\_31 Start: 18678, Stop: 20456, Start Num: 31

Candidate Starts for Anakin\_31:

(13, 18513), (22, 18636), (23, 18639), (Start: 31 @18678 has 29 MA's), (35, 18780), (37, 18801), (40, 18843), (42, 18879), (46, 18966), (52, 19104), (57, 19194), (63, 19296), (70, 19431), (74, 19479), (77, 19560), (82, 19626), (84, 19656), (86, 19665), (88, 19692), (90, 19701), (99, 19836), (101, 19887), (103, 19902), (110, 19938), (111, 19986), (120, 20121), (143, 20436),

Gene: AnnaSerena\_31 Start: 18687, Stop: 20465, Start Num: 31

Candidate Starts for AnnaSerena\_31:

(13, 18522), (23, 18648), (Start: 31 @18687 has 29 MA's), (35, 18789), (37, 18810), (38, 18831), (40, 18852), (42, 18888), (46, 18975), (52, 19113), (57, 19203), (63, 19305), (70, 19440), (74, 19488), (77, 19569), (82, 19635), (84, 19665), (86, 19674), (88, 19701), (90, 19710), (99, 19845), (101, 19896), (103, 19911), (110, 19947), (111, 19995), (120, 20130), (132, 20316), (143, 20445),

Gene: Annapurna\_31 Start: 17886, Stop: 19655, Start Num: 31

Candidate Starts for Annapurna\_31:

(Start: 31 @17886 has 29 MA's), (35, 17988), (40, 18051), (46, 18174), (47, 18177), (48, 18183), (52, 18312), (53, 18324), (66, 18537), (70, 18639), (74, 18687), (77, 18768), (82, 18834), (84, 18864), (86, 18873), (88, 18900), (90, 18909), (96, 18990), (99, 19044), (101, 19095), (103, 19110), (110, 19146), (111, 19194), (120, 19329), (127, 19458), (140, 19623), (143, 19635),

Gene: Armstrong\_17 Start: 12466, Stop: 14193, Start Num: 32

Candidate Starts for Armstrong\_17:

(Start: 32 @12466 has 6 MA's), (34, 12514), (36, 12559), (41, 12625), (43, 12682), (45, 12712), (52, 12886), (53, 12898), (71, 13204), (72, 13207), (79, 13333), (81, 13384), (84, 13423), (87, 13435), (89, 13465), (91, 13471), (92, 13507), (125, 13963), (128, 14011), (141, 14167), (142, 14170),

Gene: Artiphact\_31 Start: 18679, Stop: 20457, Start Num: 31

Candidate Starts for Artiphact\_31:

(13, 18514), (23, 18640), (Start: 31 @18679 has 29 MA's), (35, 18781), (37, 18802), (40, 18844), (42, 18880), (46, 18967), (52, 19105), (57, 19195), (70, 19432), (74, 19480), (77, 19561), (82, 19627), (84, 19657), (86, 19666), (90, 19702), (99, 19837), (101, 19888), (103, 19903), (110, 19939), (111, 19987), (119, 20083), (120, 20122), (143, 20437),

Gene: Bernstein\_17 Start: 12526, Stop: 14229, Start Num: 32

Candidate Starts for Bernstein\_17:

(Start: 32 @12526 has 6 MA's), (34, 12574), (36, 12619), (43, 12742), (45, 12772), (52, 12946), (53, 12958), (71, 13264), (72, 13267), (79, 13393), (81, 13444), (84, 13483), (87, 13495), (89, 13525), (91, 13531), (92, 13567), (120, 13933), (125, 14023), (141, 14203), (142, 14206),

Gene: Chivey\_30 Start: 17840, Stop: 19609, Start Num: 31

Candidate Starts for Chivey\_30:

(Start: 31 @17840 has 29 MA's), (35, 17942), (40, 18005), (46, 18128), (47, 18131), (48, 18137), (52, 18266), (53, 18278), (57, 18356), (62, 18446), (66, 18491), (70, 18593), (74, 18641), (82, 18788), (84, 18818), (86, 18827), (88, 18854), (90, 18863), (96, 18944), (99, 18998), (101, 19049), (103, 19064), (110, 19100), (118, 19238), (126, 19394), (127, 19412), (143, 19589),

Gene: Clayda5\_17 Start: 12466, Stop: 14199, Start Num: 32

Candidate Starts for Clayda5\_17:

(Start: 32 @12466 has 6 MA's), (34, 12514), (36, 12559), (41, 12625), (43, 12682), (45, 12712), (52, 12886), (53, 12898), (71, 13204), (72, 13207), (79, 13333), (81, 13384), (84, 13423), (87, 13435), (89, 13465), (91, 13471), (92, 13507), (120, 13873), (141, 14173), (142, 14176),

Gene: CoolCookie\_31 Start: 18685, Stop: 20463, Start Num: 31

Candidate Starts for CoolCookie\_31:

(13, 18520), (23, 18646), (Start: 31 @18685 has 29 MA's), (35, 18787), (37, 18808), (40, 18850), (42, 18886), (46, 18973), (52, 19111), (57, 19201), (63, 19303), (70, 19438), (74, 19486), (77, 19567), (82, 19633), (84, 19663), (86, 19672), (90, 19708), (99, 19843), (101, 19894), (103, 19909), (110, 19945), (111, 19993), (120, 20128), (143, 20443),

Gene: Crestdrop\_30 Start: 17749, Stop: 19518, Start Num: 31

Candidate Starts for Crestdrop\_30:

(18, 17680), (Start: 31 @17749 has 29 MA's), (35, 17851), (40, 17914), (46, 18037), (47, 18040), (48, 18046), (52, 18175), (53, 18187), (66, 18400), (70, 18502), (74, 18550), (77, 18631), (82, 18697), (84, 18727), (86, 18736), (88, 18763), (90, 18772), (96, 18853), (99, 18907), (101, 18958), (103, 18973), (110, 19009), (111, 19057), (127, 19321), (140, 19486), (143, 19498),

Gene: Cybele\_31 Start: 18655, Stop: 20433, Start Num: 31

Candidate Starts for Cybele\_31:

(13, 18490), (23, 18616), (Start: 31 @18655 has 29 MA's), (35, 18757), (37, 18778), (40, 18820), (42, 18856), (46, 18943), (52, 19081), (57, 19171), (63, 19273), (69, 19399), (70, 19408), (74, 19456), (77, 19537), (82, 19603), (84, 19633), (86, 19642), (88, 19669), (90, 19678), (99, 19813), (101, 19864), (103, 19879), (110, 19915), (111, 19963), (119, 20059), (120, 20098), (143, 20413),

Gene: DannyDe\_30 Start: 17832, Stop: 19601, Start Num: 31

Candidate Starts for DannyDe\_30:

(18, 17763), (Start: 31 @17832 has 29 MA's), (35, 17934), (40, 17997), (46, 18120), (47, 18123), (48, 18129), (52, 18258), (53, 18270), (66, 18483), (70, 18585), (74, 18633), (77, 18714), (80, 18750), (82, 18780), (84, 18810), (86, 18819), (88, 18846), (90, 18855), (96, 18936), (99, 18990), (101, 19041),

(103, 19056), (110, 19092), (111, 19140), (120, 19275), (127, 19404), (140, 19569), (143, 19581),

Gene: Dauntless\_30 Start: 18392, Stop: 20161, Start Num: 31

Candidate Starts for Dauntless\_30:

(Start: 31 @18392 has 29 MA's), (35, 18494), (40, 18557), (46, 18680), (47, 18683), (48, 18689), (52, 18818), (53, 18830), (66, 19043), (70, 19145), (74, 19193), (77, 19274), (82, 19340), (84, 19370), (86, 19379), (88, 19406), (90, 19415), (96, 19496), (99, 19550), (101, 19601), (103, 19616), (110, 19652), (127, 19964), (139, 20090), (140, 20129), (143, 20141),

Gene: DelaGarza\_22 Start: 15128, Stop: 16816, Start Num: 32

Candidate Starts for DelaGarza\_22:

(Start: 32 @15128 has 6 MA's), (39, 15275), (40, 15278), (49, 15440), (53, 15557), (54, 15569), (56, 15623), (61, 15710), (63, 15740), (65, 15749), (67, 15815), (71, 15881), (76, 15965), (83, 16073), (84, 16097), (88, 16133), (91, 16145), (92, 16181), (93, 16193), (94, 16208), (95, 16211), (97, 16235), (99, 16274), (100, 16295), (104, 16331), (108, 16352), (113, 16409), (122, 16556), (125, 16607), (129, 16652), (134, 16697), (136, 16721), (138, 16739),

Gene: Erudite\_30 Start: 18392, Stop: 20161, Start Num: 31

Candidate Starts for Erudite\_30:

(Start: 31 @18392 has 29 MA's), (35, 18494), (40, 18557), (46, 18680), (47, 18683), (48, 18689), (52, 18818), (53, 18830), (66, 19043), (70, 19145), (74, 19193), (77, 19274), (82, 19340), (84, 19370), (86, 19379), (88, 19406), (90, 19415), (96, 19496), (99, 19550), (101, 19601), (103, 19616), (110, 19652), (127, 19964), (139, 20090), (140, 20129), (143, 20141),

Gene: FreddieHg\_30 Start: 17856, Stop: 19625, Start Num: 31

Candidate Starts for FreddieHg\_30:

(Start: 31 @17856 has 29 MA's), (35, 17958), (40, 18021), (46, 18144), (47, 18147), (48, 18153), (52, 18282), (53, 18294), (57, 18372), (62, 18462), (66, 18507), (70, 18609), (74, 18657), (82, 18804), (84, 18834), (86, 18843), (88, 18870), (90, 18879), (96, 18960), (99, 19014), (101, 19065), (103, 19080), (110, 19116), (118, 19254), (126, 19410), (127, 19428), (143, 19605),

Gene: Gilda\_31 Start: 18679, Stop: 20457, Start Num: 31

Candidate Starts for Gilda\_31:

(13, 18514), (23, 18640), (Start: 31 @18679 has 29 MA's), (35, 18781), (37, 18802), (40, 18844), (42, 18880), (46, 18967), (52, 19105), (57, 19195), (63, 19297), (70, 19432), (74, 19480), (77, 19561), (82, 19627), (84, 19657), (86, 19666), (88, 19693), (90, 19702), (99, 19837), (101, 19888), (103, 19903), (110, 19939), (111, 19987), (119, 20083), (120, 20122), (143, 20437),

Gene: Hager\_32 Start: 18239, Stop: 20017, Start Num: 31

Candidate Starts for Hager\_32:

(25, 18209), (27, 18212), (28, 18224), (29, 18236), (Start: 31 @18239 has 29 MA's), (35, 18341), (40, 18404), (46, 18527), (51, 18662), (52, 18665), (53, 18677), (57, 18755), (63, 18857), (70, 18992), (74, 19040), (75, 19049), (82, 19187), (84, 19217), (86, 19226), (88, 19253), (90, 19262), (99, 19397), (101, 19448), (103, 19463), (111, 19547), (120, 19682), (143, 19997),

Gene: Haunter\_31 Start: 18092, Stop: 19870, Start Num: 31

Candidate Starts for Haunter\_31:

(23, 18053), (Start: 31 @18092 has 29 MA's), (35, 18194), (37, 18215), (40, 18257), (42, 18293), (46, 18380), (52, 18518), (57, 18608), (63, 18710), (70, 18845), (74, 18893), (77, 18974), (82, 19040), (84, 19070), (86, 19079), (88, 19106), (90, 19115), (99, 19250), (101, 19301), (103, 19316), (110, 19352), (119, 19496), (120, 19535), (131, 19706), (143, 19850),

Gene: Hiddenleaf\_30 Start: 17840, Stop: 19609, Start Num: 31

Candidate Starts for Hiddenleaf\_30:

(Start: 31 @17840 has 29 MA's), (35, 17942), (40, 18005), (46, 18128), (47, 18131), (48, 18137), (52, 18266), (53, 18278), (57, 18356), (62, 18446), (66, 18491), (70, 18593), (74, 18641), (82, 18788), (84, 18818), (86, 18827), (88, 18854), (90, 18863), (96, 18944), (99, 18998), (101, 19049), (103, 19064), (110, 19100), (118, 19238), (126, 19394), (127, 19412), (143, 19589),

Gene: JDawG\_30 Start: 18422, Stop: 20188, Start Num: 31

Candidate Starts for JDawG\_30:

(Start: 31 @18422 has 29 MA's), (35, 18524), (40, 18587), (44, 18647), (46, 18710), (47, 18713), (48, 18719), (52, 18848), (53, 18860), (70, 19172), (74, 19220), (84, 19397), (86, 19406), (90, 19442), (96, 19523), (99, 19577), (101, 19628), (103, 19643), (110, 19679), (111, 19727), (120, 19862), (127, 19991), (139, 20117), (140, 20156), (143, 20168),

Gene: JingleBells\_30 Start: 17956, Stop: 19725, Start Num: 31

Candidate Starts for JingleBells\_30:

(18, 17887), (Start: 31 @17956 has 29 MA's), (35, 18058), (40, 18121), (46, 18244), (47, 18247), (48, 18253), (52, 18382), (53, 18394), (66, 18607), (70, 18709), (74, 18757), (77, 18838), (82, 18904), (84, 18934), (86, 18943), (88, 18970), (90, 18979), (96, 19060), (99, 19114), (101, 19165), (103, 19180), (110, 19216), (127, 19528), (139, 19654), (140, 19693), (143, 19705),

Gene: Karate\_30 Start: 18091, Stop: 20484, Start Num: 2

Candidate Starts for Karate\_30:

(1, 18049), (Start: 2 @18091 has 2 MA's), (3, 18280), (5, 18301), (6, 18307), (7, 18340), (8, 18346), (11, 18466), (12, 18532), (14, 18556), (15, 18583), (17, 18625), (21, 18652), (24, 18670), (26, 18676), (35, 18808), (40, 18871), (46, 18994), (48, 19003), (50, 19105), (52, 19132), (63, 19321), (70, 19456), (74, 19504), (82, 19651), (84, 19681), (86, 19690), (88, 19717), (90, 19726), (93, 19780), (96, 19807), (99, 19861), (101, 19912), (103, 19927), (107, 19960), (110, 19975), (118, 20113), (120, 20158), (127, 20287), (143, 20464),

Gene: Kate\_31 Start: 18687, Stop: 20465, Start Num: 31

Candidate Starts for Kate\_31:

(13, 18522), (23, 18648), (Start: 31 @18687 has 29 MA's), (35, 18789), (37, 18810), (40, 18852), (42, 18888), (46, 18975), (52, 19113), (57, 19203), (63, 19305), (69, 19431), (70, 19440), (74, 19488), (77, 19569), (82, 19635), (84, 19665), (86, 19674), (88, 19701), (90, 19710), (99, 19845), (101, 19896), (103, 19911), (110, 19947), (111, 19995), (120, 20130), (143, 20445),

Gene: Krampus\_31 Start: 18685, Stop: 20463, Start Num: 31

Candidate Starts for Krampus\_31:

(13, 18520), (23, 18646), (Start: 31 @18685 has 29 MA's), (35, 18787), (37, 18808), (40, 18850), (42, 18886), (46, 18973), (52, 19111), (57, 19201), (63, 19303), (70, 19438), (74, 19486), (77, 19567), (82, 19633), (84, 19663), (86, 19672), (90, 19708), (99, 19843), (101, 19894), (103, 19909), (110, 19945), (111, 19993), (120, 20128), (143, 20443),

Gene: Lesiram\_23 Start: 15098, Stop: 16786, Start Num: 32

Candidate Starts for Lesiram\_23:

(Start: 32 @15098 has 6 MA's), (39, 15245), (40, 15248), (53, 15527), (54, 15539), (56, 15593), (63, 15710), (64, 15713), (65, 15719), (67, 15785), (71, 15851), (76, 15935), (83, 16043), (84, 16067), (85, 16073), (88, 16103), (91, 16115), (92, 16151), (93, 16163), (94, 16178), (95, 16181), (97, 16205), (99, 16244), (100, 16265), (104, 16301), (112, 16364), (122, 16526), (133, 16661), (135, 16688), (138, 16712),

Gene: MortySmith\_29 Start: 17815, Stop: 19581, Start Num: 31

Candidate Starts for MortySmith\_29:

(Start: 31 @17815 has 29 MA's), (35, 17917), (40, 17980), (46, 18103), (47, 18106), (48, 18112), (52, 18241), (53, 18253), (70, 18565), (74, 18613), (84, 18790), (86, 18799), (90, 18835), (96, 18916), (101, 19021), (103, 19036), (110, 19072), (120, 19255), (127, 19384), (143, 19561),

Gene: NarutoRun\_31 Start: 18678, Stop: 20456, Start Num: 31

Candidate Starts for NarutoRun\_31:

(13, 18513), (22, 18636), (23, 18639), (Start: 31 @18678 has 29 MA's), (35, 18780), (37, 18801), (40, 18843), (42, 18879), (46, 18966), (52, 19104), (57, 19194), (63, 19296), (70, 19431), (74, 19479), (77, 19560), (82, 19626), (84, 19656), (86, 19665), (88, 19692), (90, 19701), (99, 19836), (101, 19887), (103, 19902), (110, 19938), (111, 19986), (120, 20121), (143, 20436),

Gene: Neptune\_31 Start: 18655, Stop: 20433, Start Num: 31

Candidate Starts for Neptune\_31:

(13, 18490), (23, 18616), (Start: 31 @18655 has 29 MA's), (35, 18757), (37, 18778), (40, 18820), (42, 18856), (46, 18943), (52, 19081), (57, 19171), (63, 19273), (69, 19399), (70, 19408), (74, 19456), (77, 19537), (82, 19603), (84, 19633), (86, 19642), (88, 19669), (90, 19678), (99, 19813), (101, 19864), (103, 19879), (110, 19915), (111, 19963), (119, 20059), (120, 20098), (143, 20413),

Gene: OverHedge\_31 Start: 18645, Stop: 20423, Start Num: 31

Candidate Starts for OverHedge\_31:

(13, 18480), (23, 18606), (Start: 31 @18645 has 29 MA's), (35, 18747), (37, 18768), (40, 18810), (42, 18846), (46, 18933), (52, 19071), (57, 19161), (63, 19263), (69, 19389), (70, 19398), (74, 19446), (77, 19527), (82, 19593), (84, 19623), (86, 19632), (88, 19659), (90, 19668), (99, 19803), (101, 19854), (103, 19869), (110, 19905), (111, 19953), (120, 20088), (143, 20403),

Gene: Pharpay\_31 Start: 18700, Stop: 20478, Start Num: 31

Candidate Starts for Pharpay\_31:

(13, 18535), (23, 18661), (Start: 31 @18700 has 29 MA's), (35, 18802), (37, 18823), (40, 18865), (42, 18901), (46, 18988), (52, 19126), (57, 19216), (70, 19453), (74, 19501), (77, 19582), (82, 19648), (84, 19678), (86, 19687), (90, 19723), (99, 19858), (101, 19909), (103, 19924), (110, 19960), (111, 20008), (119, 20104), (120, 20143), (143, 20458),

Gene: PhunaPhoke\_31 Start: 18673, Stop: 20451, Start Num: 31

Candidate Starts for PhunaPhoke\_31:

(13, 18508), (23, 18634), (Start: 31 @18673 has 29 MA's), (35, 18775), (37, 18796), (40, 18838), (42, 18874), (46, 18961), (52, 19099), (57, 19189), (63, 19291), (69, 19417), (70, 19426), (74, 19474), (77, 19555), (82, 19621), (84, 19651), (86, 19660), (88, 19687), (90, 19696), (99, 19831), (101, 19882), (103, 19897), (110, 19933), (111, 19981), (119, 20077), (120, 20116), (143, 20431),

Gene: Potty\_31 Start: 18678, Stop: 20456, Start Num: 31

Candidate Starts for Potty\_31:

(13, 18513), (23, 18639), (Start: 31 @18678 has 29 MA's), (35, 18780), (37, 18801), (40, 18843), (42, 18879), (46, 18966), (52, 19104), (57, 19194), (63, 19296), (70, 19431), (74, 19479), (77, 19560), (82, 19626), (84, 19656), (86, 19665), (90, 19701), (99, 19836), (101, 19887), (103, 19902), (110, 19938), (111, 19986), (120, 20121), (143, 20436),

Gene: Poultruss\_30 Start: 18442, Stop: 20820, Start Num: 2

Candidate Starts for Poultruss\_30:

(Start: 2 @18442 has 2 MA's), (4, 18637), (9, 18751), (10, 18808), (12, 18880), (19, 18994), (20, 18997), (24, 19018), (26, 19024), (35, 19156), (40, 19219), (46, 19342), (47, 19345), (48, 19351), (50, 19453), (52, 19480), (53, 19492), (59, 19633), (66, 19702), (70, 19804), (74, 19852), (78, 19936), (82, 19999), (84, 20029), (86, 20038), (88, 20065), (90, 20074), (93, 20128), (96, 20155), (101, 20260), (102, 20272), (103, 20275), (110, 20311), (111, 20359), (120, 20494), (127, 20623), (137, 20728),



(140, 20788), (143, 20800),

Gene: Rachella\_31 Start: 18681, Stop: 20459, Start Num: 31

Candidate Starts for Rachella\_31:

(13, 18516), (23, 18642), (Start: 31 @18681 has 29 MA's), (35, 18783), (37, 18804), (40, 18846), (42, 18882), (46, 18969), (52, 19107), (57, 19197), (63, 19299), (70, 19434), (74, 19482), (77, 19563), (82, 19629), (84, 19659), (86, 19668), (88, 19695), (90, 19704), (99, 19839), (101, 19890), (103, 19905), (110, 19941), (111, 19989), (119, 20085), (120, 20124), (131, 20295), (143, 20439),

Gene: Rie18\_31 Start: 18192, Stop: 19970, Start Num: 31

Candidate Starts for Rie18\_31:

(25, 18162), (27, 18165), (28, 18177), (29, 18189), (Start: 31 @18192 has 29 MA's), (35, 18294), (40, 18357), (46, 18480), (52, 18618), (53, 18630), (57, 18708), (63, 18810), (70, 18945), (74, 18993), (78, 19077), (82, 19140), (84, 19170), (86, 19179), (88, 19206), (90, 19215), (96, 19296), (99, 19350), (101, 19401), (103, 19416), (111, 19500), (120, 19635), (124, 19725), (143, 19950),

Gene: Rollins\_17 Start: 12526, Stop: 14229, Start Num: 32

Candidate Starts for Rollins\_17:

(Start: 32 @12526 has 6 MA's), (34, 12574), (36, 12619), (43, 12742), (45, 12772), (52, 12946), (53, 12958), (71, 13264), (72, 13267), (79, 13393), (81, 13444), (84, 13483), (87, 13495), (89, 13525), (91, 13531), (92, 13567), (120, 13933), (125, 14023), (141, 14203), (142, 14206),

Gene: SilentWarrior\_30 Start: 17848, Stop: 19617, Start Num: 31

Candidate Starts for SilentWarrior\_30:

(Start: 31 @17848 has 29 MA's), (35, 17950), (40, 18013), (46, 18136), (47, 18139), (48, 18145), (52, 18274), (53, 18286), (66, 18499), (70, 18601), (74, 18649), (77, 18730), (82, 18796), (84, 18826), (86, 18835), (88, 18862), (90, 18871), (96, 18952), (99, 19006), (101, 19057), (103, 19072), (110, 19108), (111, 19156), (120, 19291), (127, 19420), (140, 19585), (143, 19597),

Gene: Snakehole\_31 Start: 17937, Stop: 19706, Start Num: 31

Candidate Starts for Snakehole\_31:

(Start: 31 @17937 has 29 MA's), (35, 18039), (40, 18102), (46, 18225), (47, 18228), (48, 18234), (52, 18363), (53, 18375), (57, 18453), (62, 18543), (66, 18588), (70, 18690), (74, 18738), (82, 18885), (84, 18915), (86, 18924), (88, 18951), (90, 18960), (96, 19041), (99, 19095), (101, 19146), (103, 19161), (110, 19197), (118, 19335), (126, 19491), (127, 19509), (143, 19686),

Gene: Tedro\_31 Start: 18151, Stop: 19929, Start Num: 31

Candidate Starts for Tedro\_31:

(13, 17986), (23, 18112), (Start: 31 @18151 has 29 MA's), (35, 18253), (37, 18274), (40, 18316), (42, 18352), (46, 18439), (52, 18577), (57, 18667), (63, 18769), (69, 18895), (70, 18904), (74, 18952), (77, 19033), (82, 19099), (84, 19129), (86, 19138), (88, 19165), (90, 19174), (99, 19309), (101, 19360), (103, 19375), (110, 19411), (111, 19459), (119, 19555), (120, 19594), (131, 19765), (143, 19909),

Gene: Teng\_24 Start: 15125, Stop: 16837, Start Num: 32

Candidate Starts for Teng\_24:

(Start: 32 @15125 has 6 MA's), (39, 15272), (40, 15275), (44, 15341), (49, 15437), (55, 15581), (57, 15659), (58, 15677), (60, 15731), (63, 15764), (64, 15767), (65, 15773), (66, 15797), (67, 15839), (68, 15857), (71, 15905), (76, 15989), (77, 16028), (78, 16031), (83, 16097), (84, 16121), (88, 16157), (91, 16169), (93, 16217), (94, 16232), (95, 16235), (97, 16259), (98, 16274), (100, 16319), (105, 16358), (109, 16382), (113, 16433), (115, 16436), (117, 16490), (120, 16541), (121, 16547), (125, 16631), (130, 16688), (136, 16745),

Gene: Tongui\_31 Start: 18184, Stop: 19953, Start Num: 30

Candidate Starts for Tongui\_31:

(25, 18154), (27, 18157), (28, 18169), (29, 18181), (30, 18184), (33, 18217), (35, 18286), (40, 18349),  
(46, 18472), (48, 18481), (50, 18583), (52, 18610), (53, 18622), (70, 18937), (74, 18985), (82, 19132),  
(84, 19162), (86, 19171), (88, 19198), (90, 19207), (101, 19393), (106, 19420), (110, 19444), (114,  
19513), (116, 19525), (117, 19573), (118, 19582), (120, 19627), (123, 19693), (143, 19933),