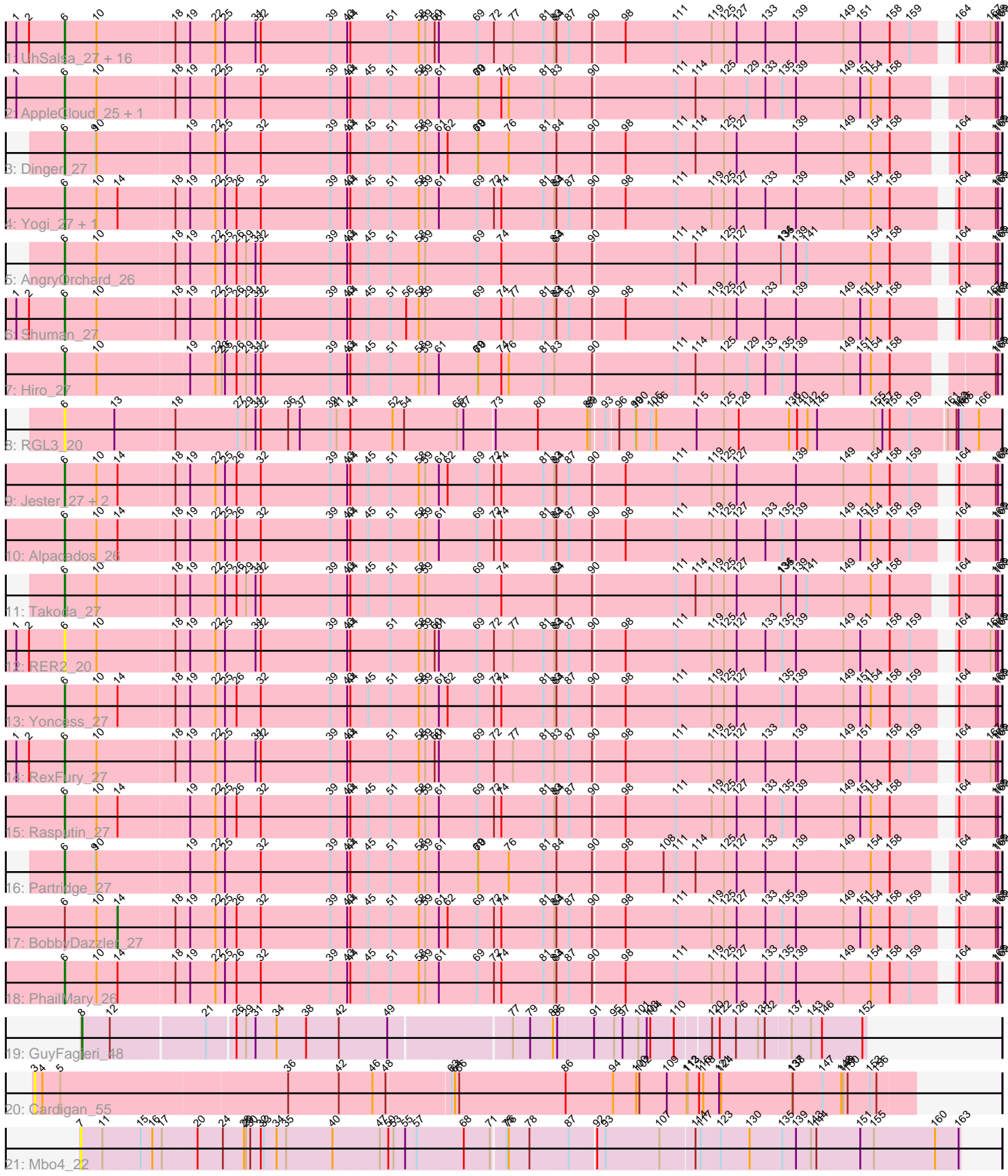


Pham 216326



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 216326 Report

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

Pham number 216326 has 41 members, 4 are drafts.

Phages represented in each track:

- Track 1 : UhSalsa\_27, Gollum\_27, Nancinator\_27, Espica\_27, Belenaria\_27, Lillie\_27, Bradshaw\_27, StCroix\_27, Swann\_27, CosmicSans\_27, Phrankenstein\_27, TWAMP\_27, Alatin\_27, Natosaleda\_27, Rhodalysa\_27, Erik\_27, Naiad\_27
- Track 2 : AppleCloud\_25, Krishelle\_27
- Track 3 : Dinger\_27
- Track 4 : Yogi\_27, Bonanza\_27
- Track 5 : AngryOrchard\_26
- Track 6 : Shuman\_27
- Track 7 : Hiro\_27
- Track 8 : RGL3\_20
- Track 9 : Jester\_27, Harlequin\_27, Bryce\_27
- Track 10 : Alpacados\_26
- Track 11 : Takoda\_27
- Track 12 : RER2\_20
- Track 13 : Yoncess\_27
- Track 14 : RexFury\_27
- Track 15 : Rasputin\_27
- Track 16 : Partridge\_27
- Track 17 : BobbyDazzler\_27
- Track 18 : PhailMary\_26
- Track 19 : GuyFagieri\_48
- Track 20 : Cardigan\_55
- Track 21 : Mbo4\_22

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

The start number called the most often in the published annotations is 6, it was called in 35 of the 37 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Alatin\_27, Alpacados\_26, AngryOrchard\_26, AppleCloud\_25, Belenaria\_27, Bonanza\_27, Bradshaw\_27, Bryce\_27, CosmicSans\_27, Dinger\_27, Erik\_27, Espica\_27, Gollum\_27, Harlequin\_27, Hiro\_27, Jester\_27, Krishelle\_27, Lillie\_27, Naiad\_27, Nancinator\_27, Natosaleda\_27, Partridge\_27, PhailMary\_26,

Phrankenstein\_27, RER2\_20, RGL3\_20, Rasputin\_27, RexFury\_27, Rhodalysa\_27, Shuman\_27, StCroix\_27, Swann\_27, TWAMP\_27, Takoda\_27, UhSalsa\_27, Yogi\_27, Yoncess\_27,

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

- BobbyDazzler\_27,

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

- Cardigan\_55, GuyFagieri\_48, Mbo4\_22,

### Summary by start number:

Start 3:

- Found in 1 of 41 ( 2.4% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Cardigan\_55 (DD),

Start 6:

- Found in 38 of 41 ( 92.7% ) of genes in pham
- Manual Annotations of this start: 35 of 37
- Called 97.4% of time when present
- Phage (with cluster) where this start called: Alatin\_27 (CA), Alpacados\_26 (CA), AngryOrchard\_26 (CA), AppleCloud\_25 (CA), Belenaria\_27 (CA), Bonanza\_27 (CA), Bradshaw\_27 (CA), Bryce\_27 (CA), CosmicSans\_27 (CA), Dinger\_27 (CA), Erik\_27 (CA), Espica\_27 (CA), Gollum\_27 (CA), Harlequin\_27 (CA), Hiro\_27 (CA), Jester\_27 (CA), Krishelle\_27 (CA), Lillie\_27 (CA), Naiad\_27 (CA), Nancinator\_27 (CA), Natosaleda\_27 (CA), Partridge\_27 (CA), PhailMary\_26 (CA), Phrankenstein\_27 (CA), RER2\_20 (CA), RGL3\_20 (CA), Rasputin\_27 (CA), RexFury\_27 (CA), Rhodalysa\_27 (CA), Shuman\_27 (CA), StCroix\_27 (CA), Swann\_27 (CA), TWAMP\_27 (CA), Takoda\_27 (CA), UhSalsa\_27 (CA), Yogi\_27 (CA), Yoncess\_27 (CA),

Start 7:

- Found in 1 of 41 ( 2.4% ) of genes in pham
- No Manual Annotations of this start.
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Mbo4\_22 (singleton),

Start 8:

- Found in 1 of 41 ( 2.4% ) of genes in pham
- Manual Annotations of this start: 1 of 37
- Called 100.0% of time when present
- Phage (with cluster) where this start called: GuyFagieri\_48 (CR),

Start 14:

- Found in 10 of 41 ( 24.4% ) of genes in pham
- Manual Annotations of this start: 1 of 37
- Called 10.0% of time when present
- Phage (with cluster) where this start called: BobbyDazzler\_27 (CA),

### Summary by clusters:

There are 4 clusters represented in this pham: CR, CA, singleton, DD,

Info for manual annotations of cluster CA:

- Start number 6 was manually annotated 35 times for cluster CA.
- Start number 14 was manually annotated 1 time for cluster CA.

Info for manual annotations of cluster CR:

- Start number 8 was manually annotated 1 time for cluster CR.

### **Gene Information:**

Gene: Alatin\_27 Start: 19094, Stop: 21670, Start Num: 6

Candidate Starts for Alatin\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419), (164, 21557), (167, 21638), (168, 21653), (169, 21659),

Gene: Alpacados\_26 Start: 19030, Stop: 21552, Start Num: 6

Candidate Starts for Alpacados\_26:

(Start: 6 @19030 has 35 MA's), (10, 19120), (Start: 14 @19180 has 1 MA's), (18, 19339), (19, 19372), (22, 19441), (25, 19468), (26, 19501), (32, 19570), (39, 19768), (43, 19816), (44, 19825), (45, 19873), (51, 19936), (58, 20017), (59, 20035), (61, 20074), (69, 20176), (72, 20224), (74, 20245), (81, 20356), (83, 20386), (84, 20392), (87, 20422), (90, 20482), (98, 20566), (111, 20710), (119, 20803), (125, 20833), (127, 20869), (133, 20950), (135, 20998), (139, 21037), (149, 21166), (151, 21214), (154, 21244), (158, 21298), (159, 21355), (164, 21439), (168, 21535), (169, 21541),

Gene: AngryOrchard\_26 Start: 19013, Stop: 21535, Start Num: 6

Candidate Starts for AngryOrchard\_26:

(Start: 6 @19013 has 35 MA's), (10, 19103), (18, 19322), (19, 19355), (22, 19424), (25, 19451), (26, 19484), (29, 19511), (31, 19538), (32, 19553), (39, 19751), (43, 19799), (44, 19808), (45, 19856), (51, 19919), (58, 20000), (59, 20018), (69, 20159), (74, 20228), (83, 20369), (84, 20375), (90, 20465), (111, 20693), (114, 20744), (125, 20816), (127, 20852), (134, 20978), (135, 20981), (139, 21020), (141, 21050), (154, 21227), (158, 21281), (164, 21422), (168, 21518), (169, 21524),

Gene: AppleCloud\_25 Start: 19059, Stop: 21581, Start Num: 6

Candidate Starts for AppleCloud\_25:

(1, 18921), (Start: 6 @19059 has 35 MA's), (10, 19149), (18, 19368), (19, 19401), (22, 19470), (25, 19497), (32, 19599), (39, 19797), (43, 19845), (44, 19854), (45, 19902), (51, 19965), (58, 20046), (59, 20064), (61, 20103), (69, 20205), (70, 20208), (74, 20274), (76, 20295), (81, 20385), (83, 20415), (90, 20511), (111, 20739), (114, 20790), (125, 20862), (129, 20928), (133, 20979), (135, 21027), (139, 21066), (149, 21195), (151, 21243), (154, 21273), (158, 21327), (168, 21564), (169, 21570),

Gene: Belenaria\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for Belenaria\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897),

(127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419), (164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: BobbyDazzler\_27 Start: 19289, Stop: 21661, Start Num: 14

Candidate Starts for BobbyDazzler\_27:

(Start: 6 @19139 has 35 MA's), (10, 19229), (Start: 14 @19289 has 1 MA's), (18, 19448), (19, 19481), (22, 19550), (25, 19577), (26, 19610), (32, 19679), (39, 19877), (43, 19925), (44, 19934), (45, 19982), (51, 20045), (58, 20126), (59, 20144), (61, 20183), (62, 20204), (69, 20285), (72, 20333), (74, 20354), (81, 20465), (83, 20495), (84, 20501), (87, 20531), (90, 20591), (98, 20675), (111, 20819), (119, 20912), (125, 20942), (127, 20978), (133, 21059), (135, 21107), (139, 21146), (149, 21275), (151, 21323), (154, 21353), (158, 21407), (159, 21464), (164, 21548), (168, 21644), (169, 21650),

Gene: Bonanza\_27 Start: 19068, Stop: 21590, Start Num: 6

Candidate Starts for Bonanza\_27:

(Start: 6 @19068 has 35 MA's), (10, 19158), (Start: 14 @19218 has 1 MA's), (18, 19377), (19, 19410), (22, 19479), (25, 19506), (26, 19539), (32, 19608), (39, 19806), (43, 19854), (44, 19863), (45, 19911), (51, 19974), (58, 20055), (59, 20073), (61, 20112), (69, 20214), (72, 20262), (74, 20283), (81, 20394), (83, 20424), (84, 20430), (87, 20460), (90, 20520), (98, 20604), (111, 20748), (119, 20841), (125, 20871), (127, 20907), (133, 20988), (139, 21075), (149, 21204), (154, 21282), (158, 21336), (164, 21477), (168, 21573), (169, 21579),

Gene: Bradshaw\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for Bradshaw\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419), (164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: Bryce\_27 Start: 19068, Stop: 21590, Start Num: 6

Candidate Starts for Bryce\_27:

(Start: 6 @19068 has 35 MA's), (10, 19158), (Start: 14 @19218 has 1 MA's), (18, 19377), (19, 19410), (22, 19479), (25, 19506), (26, 19539), (32, 19608), (39, 19806), (43, 19854), (44, 19863), (45, 19911), (51, 19974), (58, 20055), (59, 20073), (61, 20112), (62, 20133), (69, 20214), (72, 20262), (74, 20283), (81, 20394), (83, 20424), (84, 20430), (87, 20460), (90, 20520), (98, 20604), (111, 20748), (119, 20841), (125, 20871), (127, 20907), (139, 21075), (149, 21204), (154, 21282), (158, 21336), (159, 21393), (164, 21477), (168, 21573), (169, 21579),

Gene: Cardigan\_55 Start: 38491, Stop: 40887, Start Num: 3

Candidate Starts for Cardigan\_55:

(3, 38491), (4, 38512), (5, 38563), (36, 39172), (42, 39316), (46, 39409), (48, 39445), (63, 39616), (64, 39625), (66, 39637), (86, 39934), (94, 40063), (100, 40129), (102, 40138), (109, 40216), (112, 40270), (113, 40273), (116, 40300), (118, 40312), (121, 40351), (124, 40357), (137, 40555), (138, 40558), (147, 40639), (148, 40687), (149, 40693), (150, 40705), (153, 40762), (156, 40780),

Gene: CosmicSans\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for CosmicSans\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419),

(164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: Dinger\_27 Start: 19064, Stop: 21586, Start Num: 6

Candidate Starts for Dinger\_27:

(Start: 6 @19064 has 35 MA's), (9, 19151), (10, 19154), (19, 19406), (22, 19475), (25, 19502), (32, 19604), (39, 19802), (43, 19850), (44, 19859), (45, 19907), (51, 19970), (58, 20051), (59, 20069), (61, 20108), (62, 20129), (69, 20210), (70, 20213), (76, 20300), (81, 20390), (84, 20426), (90, 20516), (98, 20600), (111, 20744), (114, 20795), (125, 20867), (127, 20903), (139, 21071), (149, 21200), (154, 21278), (158, 21332), (164, 21473), (168, 21569), (169, 21575),

Gene: Erik\_27 Start: 19093, Stop: 21615, Start Num: 6

Candidate Starts for Erik\_27:

(1, 18955), (2, 18991), (Start: 6 @19093 has 35 MA's), (10, 19183), (18, 19402), (19, 19435), (22, 19504), (25, 19531), (31, 19618), (32, 19633), (39, 19831), (43, 19879), (44, 19888), (51, 19999), (58, 20080), (59, 20098), (60, 20125), (61, 20137), (69, 20239), (72, 20287), (77, 20341), (81, 20419), (83, 20449), (84, 20455), (87, 20485), (90, 20545), (98, 20629), (111, 20773), (119, 20866), (125, 20896), (127, 20932), (133, 21013), (139, 21100), (149, 21229), (151, 21277), (158, 21361), (159, 21418), (164, 21502), (167, 21583), (168, 21598), (169, 21604),

Gene: Espica\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for Espica\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419), (164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: Gollum\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for Gollum\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419), (164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: GuyFagieri\_48 Start: 34232, Stop: 36250, Start Num: 8

Candidate Starts for GuyFagieri\_48:

(Start: 8 @34232 has 1 MA's), (12, 34298), (21, 34547), (26, 34622), (29, 34649), (31, 34676), (34, 34736), (38, 34820), (42, 34910), (49, 35042), (77, 35360), (79, 35408), (82, 35468), (85, 35480), (91, 35579), (95, 35636), (97, 35660), (101, 35702), (103, 35720), (104, 35729), (110, 35786), (120, 35861), (122, 35879), (126, 35924), (131, 35972), (132, 35990), (137, 36053), (143, 36104), (146, 36131), (152, 36239),

Gene: Harlequin\_27 Start: 19044, Stop: 21620, Start Num: 6

Candidate Starts for Harlequin\_27:

(Start: 6 @19044 has 35 MA's), (10, 19134), (Start: 14 @19194 has 1 MA's), (18, 19353), (19, 19386), (22, 19455), (25, 19482), (26, 19515), (32, 19584), (39, 19782), (43, 19830), (44, 19839), (45, 19887), (51, 19950), (58, 20031), (59, 20049), (61, 20088), (62, 20109), (69, 20190), (72, 20238), (74, 20259), (81, 20370), (83, 20400), (84, 20406), (87, 20436), (90, 20496), (98, 20580), (111, 20724), (119, 20817), (125, 20847), (127, 20883), (139, 21051), (149, 21180), (154, 21258), (158, 21312), (159, 21369), (164, 21507), (168, 21603), (169, 21609),

Gene: Hiro\_27 Start: 19350, Stop: 21872, Start Num: 6

Candidate Starts for Hiro\_27:

(Start: 6 @19350 has 35 MA's), (10, 19440), (19, 19692), (22, 19761), (23, 19779), (25, 19788), (26, 19821), (29, 19848), (31, 19875), (32, 19890), (39, 20088), (43, 20136), (44, 20145), (45, 20193), (51, 20256), (58, 20337), (59, 20355), (61, 20394), (69, 20496), (70, 20499), (74, 20565), (76, 20586), (81, 20676), (83, 20706), (90, 20802), (111, 21030), (114, 21081), (125, 21153), (129, 21219), (133, 21270), (135, 21318), (139, 21357), (149, 21486), (151, 21534), (154, 21564), (158, 21618), (168, 21855), (169, 21861),

Gene: Jester\_27 Start: 19038, Stop: 21560, Start Num: 6

Candidate Starts for Jester\_27:

(Start: 6 @19038 has 35 MA's), (10, 19128), (Start: 14 @19188 has 1 MA's), (18, 19347), (19, 19380), (22, 19449), (25, 19476), (26, 19509), (32, 19578), (39, 19776), (43, 19824), (44, 19833), (45, 19881), (51, 19944), (58, 20025), (59, 20043), (61, 20082), (62, 20103), (69, 20184), (72, 20232), (74, 20253), (81, 20364), (83, 20394), (84, 20400), (87, 20430), (90, 20490), (98, 20574), (111, 20718), (119, 20811), (125, 20841), (127, 20877), (139, 21045), (149, 21174), (154, 21252), (158, 21306), (159, 21363), (164, 21447), (168, 21543), (169, 21549),

Gene: Krishelle\_27 Start: 19365, Stop: 21923, Start Num: 6

Candidate Starts for Krishelle\_27:

(1, 19227), (Start: 6 @19365 has 35 MA's), (10, 19455), (18, 19674), (19, 19707), (22, 19776), (25, 19803), (32, 19905), (39, 20103), (43, 20151), (44, 20160), (45, 20208), (51, 20271), (58, 20352), (59, 20370), (61, 20409), (69, 20511), (70, 20514), (74, 20580), (76, 20601), (81, 20691), (83, 20721), (90, 20817), (111, 21045), (114, 21096), (125, 21168), (129, 21234), (133, 21285), (135, 21333), (139, 21372), (149, 21501), (151, 21549), (154, 21579), (158, 21633), (168, 21906), (169, 21912),

Gene: Lillie\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for Lillie\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419), (164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: Mbo4\_22 Start: 19737, Stop: 22112, Start Num: 7

Candidate Starts for Mbo4\_22:

(7, 19737), (11, 19794), (15, 19899), (16, 19929), (17, 19956), (20, 20046), (24, 20118), (28, 20175), (29, 20181), (30, 20193), (32, 20223), (33, 20232), (34, 20268), (35, 20295), (40, 20427), (47, 20556), (50, 20580), (53, 20595), (55, 20628), (57, 20661), (68, 20793), (71, 20856), (75, 20892), (76, 20898), (78, 20952), (87, 21057), (92, 21120), (93, 21141), (107, 21291), (114, 21378), (117, 21393), (123, 21441), (130, 21522), (135, 21609), (139, 21648), (143, 21690), (144, 21705), (151, 21828), (155, 21867), (160, 22041), (163, 22107),

Gene: Naiad\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for Naiad\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419), (164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: Nancinator\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for Nancinator\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419), (164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: Natosaleda\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for Natosaleda\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419), (164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: Partridge\_27 Start: 19127, Stop: 21649, Start Num: 6

Candidate Starts for Partridge\_27:

(Start: 6 @19127 has 35 MA's), (9, 19214), (10, 19217), (19, 19469), (22, 19538), (25, 19565), (32, 19667), (39, 19865), (43, 19913), (44, 19922), (45, 19970), (51, 20033), (58, 20114), (59, 20132), (61, 20171), (69, 20273), (70, 20276), (76, 20363), (81, 20453), (84, 20489), (90, 20579), (98, 20663), (108, 20771), (111, 20807), (114, 20858), (125, 20930), (127, 20966), (133, 21047), (139, 21134), (149, 21263), (154, 21341), (158, 21395), (164, 21536), (168, 21632), (169, 21638),

Gene: PhailMary\_26 Start: 19416, Stop: 21938, Start Num: 6

Candidate Starts for PhailMary\_26:

(Start: 6 @19416 has 35 MA's), (10, 19506), (Start: 14 @19566 has 1 MA's), (18, 19725), (19, 19758), (22, 19827), (25, 19854), (26, 19887), (32, 19956), (39, 20154), (43, 20202), (44, 20211), (45, 20259), (51, 20322), (58, 20403), (59, 20421), (61, 20460), (69, 20562), (72, 20610), (74, 20631), (81, 20742), (83, 20772), (84, 20778), (87, 20808), (90, 20868), (98, 20952), (111, 21096), (119, 21189), (125, 21219), (127, 21255), (133, 21336), (135, 21384), (139, 21423), (149, 21552), (154, 21630), (158, 21684), (159, 21741), (164, 21825), (168, 21921), (169, 21927),

Gene: Phrankenstein\_27 Start: 19094, Stop: 21562, Start Num: 6

Candidate Starts for Phrankenstein\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419), (164, 21449), (167, 21530), (168, 21545), (169, 21551),

Gene: RER2\_20 Start: 15966, Stop: 18488, Start Num: 6

Candidate Starts for RER2\_20:

(1, 15828), (2, 15864), (Start: 6 @15966 has 35 MA's), (10, 16056), (18, 16275), (19, 16308), (22, 16377), (25, 16404), (31, 16491), (32, 16506), (39, 16704), (43, 16752), (44, 16761), (51, 16872), (58, 16953), (59, 16971), (60, 16998), (61, 17010), (69, 17112), (72, 17160), (77, 17214), (81, 17292), (83, 17322), (84, 17328), (87, 17358), (90, 17418), (98, 17502), (111, 17646), (119, 17739), (125, 17769), (127, 17805), (133, 17886), (135, 17934), (139, 17973), (149, 18102), (151, 18150), (158, 18234), (159, 18291), (164, 18375), (167, 18456), (168, 18471), (169, 18477),



Gene: RGL3\_20 Start: 16114, Stop: 18651, Start Num: 6

Candidate Starts for RGL3\_20:

(Start: 6 @16114 has 35 MA's), (13, 16255), (18, 16423), (27, 16585), (29, 16609), (31, 16636), (32, 16651), (36, 16729), (37, 16762), (39, 16849), (41, 16867), (44, 16906), (52, 17023), (54, 17056), (65, 17197), (67, 17215), (73, 17296), (80, 17404), (88, 17524), (89, 17527), (93, 17560), (96, 17590), (99, 17635), (100, 17638), (105, 17677), (106, 17692), (115, 17803), (125, 17881), (128, 17923), (136, 18061), (140, 18082), (142, 18112), (145, 18139), (155, 18298), (157, 18322), (158, 18343), (159, 18400), (161, 18499), (162, 18523), (163, 18529), (165, 18538), (166, 18586),

Gene: Rasputin\_27 Start: 19062, Stop: 21584, Start Num: 6

Candidate Starts for Rasputin\_27:

(Start: 6 @19062 has 35 MA's), (10, 19152), (Start: 14 @19212 has 1 MA's), (19, 19404), (22, 19473), (25, 19500), (26, 19533), (32, 19602), (39, 19800), (43, 19848), (44, 19857), (45, 19905), (51, 19968), (58, 20049), (59, 20067), (61, 20106), (69, 20208), (72, 20256), (74, 20277), (81, 20388), (83, 20418), (84, 20424), (87, 20454), (90, 20514), (98, 20598), (111, 20742), (119, 20835), (125, 20865), (127, 20901), (133, 20982), (135, 21030), (139, 21069), (149, 21198), (151, 21246), (154, 21276), (158, 21330), (164, 21471), (168, 21567), (169, 21573),

Gene: RexFury\_27 Start: 19125, Stop: 21647, Start Num: 6

Candidate Starts for RexFury\_27:

(1, 18987), (2, 19023), (Start: 6 @19125 has 35 MA's), (10, 19215), (18, 19434), (19, 19467), (22, 19536), (25, 19563), (31, 19650), (32, 19665), (39, 19863), (43, 19911), (44, 19920), (51, 20031), (58, 20112), (59, 20130), (60, 20157), (61, 20169), (69, 20271), (72, 20319), (77, 20373), (81, 20451), (83, 20481), (87, 20517), (90, 20577), (98, 20661), (111, 20805), (119, 20898), (125, 20928), (127, 20964), (133, 21045), (139, 21132), (149, 21261), (151, 21309), (158, 21393), (159, 21450), (164, 21534), (167, 21615), (168, 21630), (169, 21636),

Gene: Rhodalysa\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for Rhodalysa\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419), (164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: Shuman\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for Shuman\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (26, 19565), (29, 19592), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (45, 19937), (51, 20000), (56, 20045), (58, 20081), (59, 20099), (69, 20240), (74, 20309), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (154, 21308), (158, 21362), (164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: StCroix\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for StCroix\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419),

(164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: Swann\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for Swann\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419), (164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: TWAMP\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for TWAMP\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419), (164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: Takoda\_27 Start: 19054, Stop: 21576, Start Num: 6

Candidate Starts for Takoda\_27:

(Start: 6 @19054 has 35 MA's), (10, 19144), (18, 19363), (19, 19396), (22, 19465), (25, 19492), (26, 19525), (29, 19552), (31, 19579), (32, 19594), (39, 19792), (43, 19840), (44, 19849), (45, 19897), (51, 19960), (58, 20041), (59, 20059), (69, 20200), (74, 20269), (83, 20410), (84, 20416), (90, 20506), (111, 20734), (114, 20785), (119, 20827), (125, 20857), (127, 20893), (134, 21019), (135, 21022), (139, 21061), (141, 21091), (149, 21190), (154, 21268), (158, 21322), (164, 21463), (168, 21559), (169, 21565),

Gene: UhSalsa\_27 Start: 19094, Stop: 21616, Start Num: 6

Candidate Starts for UhSalsa\_27:

(1, 18956), (2, 18992), (Start: 6 @19094 has 35 MA's), (10, 19184), (18, 19403), (19, 19436), (22, 19505), (25, 19532), (31, 19619), (32, 19634), (39, 19832), (43, 19880), (44, 19889), (51, 20000), (58, 20081), (59, 20099), (60, 20126), (61, 20138), (69, 20240), (72, 20288), (77, 20342), (81, 20420), (83, 20450), (84, 20456), (87, 20486), (90, 20546), (98, 20630), (111, 20774), (119, 20867), (125, 20897), (127, 20933), (133, 21014), (139, 21101), (149, 21230), (151, 21278), (158, 21362), (159, 21419), (164, 21503), (167, 21584), (168, 21599), (169, 21605),

Gene: Yogi\_27 Start: 19068, Stop: 21590, Start Num: 6

Candidate Starts for Yogi\_27:

(Start: 6 @19068 has 35 MA's), (10, 19158), (Start: 14 @19218 has 1 MA's), (18, 19377), (19, 19410), (22, 19479), (25, 19506), (26, 19539), (32, 19608), (39, 19806), (43, 19854), (44, 19863), (45, 19911), (51, 19974), (58, 20055), (59, 20073), (61, 20112), (69, 20214), (72, 20262), (74, 20283), (81, 20394), (83, 20424), (84, 20430), (87, 20460), (90, 20520), (98, 20604), (111, 20748), (119, 20841), (125, 20871), (127, 20907), (133, 20988), (139, 21075), (149, 21204), (154, 21282), (158, 21336), (164, 21477), (168, 21573), (169, 21579),

Gene: Yoncess\_27 Start: 19068, Stop: 21590, Start Num: 6

Candidate Starts for Yoncess\_27:

(Start: 6 @19068 has 35 MA's), (10, 19158), (Start: 14 @19218 has 1 MA's), (18, 19377), (19, 19410), (22, 19479), (25, 19506), (26, 19539), (32, 19608), (39, 19806), (43, 19854), (44, 19863), (45, 19911), (51, 19974), (58, 20055), (59, 20073), (61, 20112), (62, 20133), (69, 20214), (72, 20262), (74, 20283), (81, 20394), (83, 20424), (84, 20430), (87, 20460), (90, 20520), (98, 20604), (111, 20748), (119,

20841), (125, 20871), (127, 20907), (135, 21036), (139, 21075), (149, 21204), (151, 21252), (154, 21282), (158, 21336), (159, 21393), (164, 21477), (168, 21573), (169, 21579),