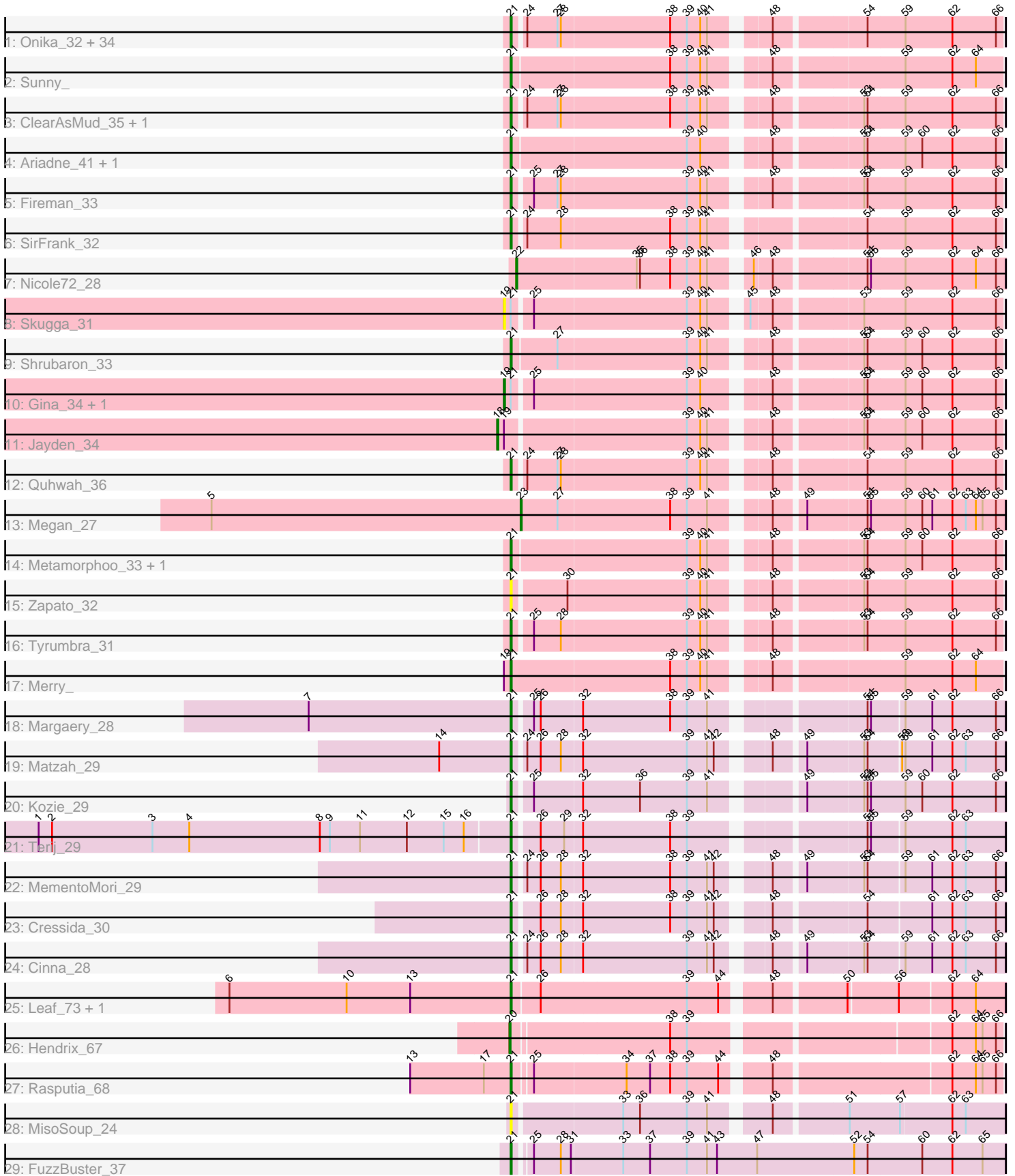


Pham 311570



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 311570 Report

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

Pham number 311570 has 68 members, 7 are drafts.

Phages represented in each track:

- Track 1 : Onika\_32, Scumberland\_34, Pulchra\_34, Lucretia\_33, Piperis\_33, Selwyn23\_34, Yeti\_33, Ramiel05\_32, Cranjis\_34, Glorp\_34, Antares\_33, Honeyfin\_34, Kowalski\_32, Jollipop\_33, EarickHC\_33, PiperSansNom\_33, Phrancesco\_33, KaiHaiDragon\_33, Germa\_34, Paschalis\_32, Ganandorf\_32, BrazzalePHS\_32, CrazyRich\_32, Hermeonysus\_32, PhedwardCullen\_32, LittleFortune\_34, Savannah\_32, Jefe\_33, BeagleBug\_32, Busephilis\_32, Shotgun\_32, Phorgeous\_32, Crisis\_34, PierreOrion\_33, Rockwell\_32
- Track 2 : Sunny\_
- Track 3 : ClearAsMud\_35, NoodlelyBoi\_33
- Track 4 : Ariadne\_41, Smarties\_41
- Track 5 : Fireman\_33
- Track 6 : SirFrank\_32
- Track 7 : Nicole72\_28
- Track 8 : Skugga\_31
- Track 9 : Shrubaron\_33
- Track 10 : Gina\_34, Teamocil\_34
- Track 11 : Jayden\_34
- Track 12 : Quhwah\_36
- Track 13 : Megan\_27
- Track 14 : Metamorphoo\_33, RobsFeet\_34
- Track 15 : Zapato\_32
- Track 16 : Tyumbra\_31
- Track 17 : Merry\_
- Track 18 : Margaery\_28
- Track 19 : Matzah\_29
- Track 20 : Kozie\_29
- Track 21 : Terij\_29
- Track 22 : MementoMori\_29
- Track 23 : Cressida\_30
- Track 24 : Cinna\_28
- Track 25 : Leaf\_73, Dewdrop\_73
- Track 26 : Hendrix\_67
- Track 27 : Rasputia\_68
- Track 28 : MisoSoup\_24
- Track 29 : FuzzBuster\_37

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

The start number called the most often in the published annotations is 21, it was called in 55 of the 61 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Antares\_33, Ariadne\_41, BeagleBug\_32, BrazzalePHS\_32, Busephilis\_32, Cinna\_28, ClearAsMud\_35, Cranjis\_34, CrazyRich\_32, Cressida\_30, Crisis\_34, Dewdrop\_73, EarickHC\_33, Fireman\_33, FuzzBuster\_37, Ganandorf\_32, Germa\_34, Glorp\_34, Hermeonysus\_32, Honeyfin\_34, Jefe\_33, Jollipop\_33, KaiHaiDragon\_33, Kowalski\_32, Kozi\_29, Leaf\_73, LittleFortune\_34, Lucretia\_33, Margaery\_28, Matzah\_29, MementoMori\_29, Merry\_, Metamorphoo\_33, MisoSoup\_24, NoodlelyBoi\_33, Onika\_32, Paschalis\_32, PhedwardCullen\_32, Phorgeous\_32, Phrancesco\_33, PierreOrion\_33, PiperSansNom\_33, Piperis\_33, Pulchra\_34, Quhwah\_36, Ramiel05\_32, Rasputia\_68, RobsFeet\_34, Rockwell\_32, Savannah\_32, Scumberland\_34, Selwyn23\_34, Shotgun\_32, Shrubaron\_33, SirFrank\_32, Smarties\_41, Sunny\_, Terij\_29, Tyumbra\_31, Yeti\_33, Zapato\_32,

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

- Gina\_34, Skugga\_31, Teamocil\_34,

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

- Hendrix\_67, Jayden\_34, Megan\_27, Nicole72\_28,

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

Start 18:

- Found in 1 of 68 ( 1.5% ) of genes in pham
- Manual Annotations of this start: 1 of 61
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Jayden\_34 (EC),

Start 19:

- Found in 5 of 68 ( 7.4% ) of genes in pham
- Manual Annotations of this start: 2 of 61
- Called 60.0% of time when present
- Phage (with cluster) where this start called: Gina\_34 (EC), Skugga\_31 (EC), Teamocil\_34 (EC),

Start 20:

- Found in 1 of 68 ( 1.5% ) of genes in pham
- Manual Annotations of this start: 1 of 61
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Hendrix\_67 (GC),

Start 21:

- Found in 64 of 68 ( 94.1% ) of genes in pham
- Manual Annotations of this start: 55 of 61
- Called 95.3% of time when present
- Phage (with cluster) where this start called: Antares\_33 (EC), Ariadne\_41 (EC), BeagleBug\_32 (EC), BrazzalePHS\_32 (EC), Busephilis\_32 (EC), Cinna\_28 (EI), ClearAsMud\_35 (EC), Cranjis\_34 (EC), CrazyRich\_32 (EC), Cressida\_30 (EI),

Crisis\_34 (EC), Dewdrop\_73 (GC), EarickHC\_33 (EC), Fireman\_33 (EC), FuzzBuster\_37 (GM), Ganandorf\_32 (EC), Germa\_34 (EC), Glorp\_34 (EC), Hermeonysus\_32 (EC), Honeyfin\_34 (EC), Jefe\_33 (EC), Jollipop\_33 (EC), KaiHaiDragon\_33 (EC), Kowalski\_32 (EC), Kozie\_29 (EI), Leaf\_73 (GC), LittleFortune\_34 (EC), Lucretia\_33 (EC), Margaery\_28 (EI), Matzah\_29 (EI), MementoMori\_29 (EI), Merry\_(EC), Metamorphoo\_33 (EC), MisoSoup\_24 (GM), NoodlelyBoi\_33 (EC), Onika\_32 (EC), Paschalis\_32 (EC), PhedwardCullen\_32 (EC), Phorgeous\_32 (EC), Phrancesco\_33 (EC), PierreOrion\_33 (EC), PiperSansNom\_33 (EC), Piperis\_33 (EC), Pulchra\_34 (EC), Quhwah\_36 (EC), Ramiel05\_32 (EC), Rasputia\_68 (GC), RobsFeet\_34 (EC), Rockwell\_32 (EC), Savannah\_32 (EC), Scumberland\_34 (EC), Selwyn23\_34 (EC), Shotgun\_32 (EC), Shrubaron\_33 (EC), SirFrank\_32 (EC), Smarties\_41 (EC), Sunny\_(EC), Terij\_29 (EI), Tyumbra\_31 (EC), Yeti\_33 (EC), Zapato\_32 (EC),

Start 22:

- Found in 1 of 68 ( 1.5% ) of genes in pham
- Manual Annotations of this start: 1 of 61
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Nicole72\_28 (EC),

Start 23:

- Found in 1 of 68 ( 1.5% ) of genes in pham
- Manual Annotations of this start: 1 of 61
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Megan\_27 (EC),

### **Summary by clusters:**

There are 4 clusters represented in this pham: GC, GM, EI, EC,

Info for manual annotations of cluster EC:

- Start number 18 was manually annotated 1 time for cluster EC.
- Start number 19 was manually annotated 2 times for cluster EC.
- Start number 21 was manually annotated 44 times for cluster EC.
- Start number 22 was manually annotated 1 time for cluster EC.
- Start number 23 was manually annotated 1 time for cluster EC.

Info for manual annotations of cluster EI:

- Start number 21 was manually annotated 7 times for cluster EI.

Info for manual annotations of cluster GC:

- Start number 20 was manually annotated 1 time for cluster GC.
- Start number 21 was manually annotated 3 times for cluster GC.

Info for manual annotations of cluster GM:

- Start number 21 was manually annotated 1 time for cluster GM.

### **Gene Information:**

Gene: Antares\_33 Start: 19596, Stop: 20000, Start Num: 21

Candidate Starts for Antares\_33:

(Start: 21 @19596 has 55 MA's), (24, 19605), (27, 19632), (28, 19635), (38, 19731), (39, 19746), (40, 19758), (41, 19764), (48, 19806), (54, 19881), (59, 19914), (62, 19956), (66, 19995),

Gene: Ariadne\_41 Start: 21286, Stop: 21693, Start Num: 21

Candidate Starts for Ariadne\_41:

(Start: 21 @21286 has 55 MA's), (39, 21439), (40, 21451), (48, 21499), (53, 21571), (54, 21574), (59, 21607), (60, 21622), (62, 21649), (66, 21688),

Gene: BeagleBug\_32 Start: 19377, Stop: 19781, Start Num: 21

Candidate Starts for BeagleBug\_32:

(Start: 21 @19377 has 55 MA's), (24, 19386), (27, 19413), (28, 19416), (38, 19512), (39, 19527), (40, 19539), (41, 19545), (48, 19587), (54, 19662), (59, 19695), (62, 19737), (66, 19776),

Gene: BrazzalePHS\_32 Start: 19391, Stop: 19795, Start Num: 21

Candidate Starts for BrazzalePHS\_32:

(Start: 21 @19391 has 55 MA's), (24, 19400), (27, 19427), (28, 19430), (38, 19526), (39, 19541), (40, 19553), (41, 19559), (48, 19601), (54, 19676), (59, 19709), (62, 19751), (66, 19790),

Gene: Busephilis\_32 Start: 19326, Stop: 19730, Start Num: 21

Candidate Starts for Busephilis\_32:

(Start: 21 @19326 has 55 MA's), (24, 19335), (27, 19362), (28, 19365), (38, 19461), (39, 19476), (40, 19488), (41, 19494), (48, 19536), (54, 19611), (59, 19644), (62, 19686), (66, 19725),

Gene: Cinna\_28 Start: 18809, Stop: 19213, Start Num: 21

Candidate Starts for Cinna\_28:

(Start: 21 @18809 has 55 MA's), (24, 18818), (26, 18830), (28, 18848), (32, 18866), (39, 18959), (41, 18977), (42, 18983), (48, 19019), (49, 19043), (53, 19091), (54, 19094), (59, 19124), (61, 19148), (62, 19166), (63, 19178), (66, 19205),

Gene: ClearAsMud\_35 Start: 20105, Stop: 20509, Start Num: 21

Candidate Starts for ClearAsMud\_35:

(Start: 21 @20105 has 55 MA's), (24, 20114), (27, 20141), (28, 20144), (38, 20240), (39, 20255), (40, 20267), (41, 20273), (48, 20315), (53, 20387), (54, 20390), (59, 20423), (62, 20465), (66, 20504),

Gene: Cranjis\_34 Start: 19551, Stop: 19955, Start Num: 21

Candidate Starts for Cranjis\_34:

(Start: 21 @19551 has 55 MA's), (24, 19560), (27, 19587), (28, 19590), (38, 19686), (39, 19701), (40, 19713), (41, 19719), (48, 19761), (54, 19836), (59, 19869), (62, 19911), (66, 19950),

Gene: CrazyRich\_32 Start: 19360, Stop: 19764, Start Num: 21

Candidate Starts for CrazyRich\_32:

(Start: 21 @19360 has 55 MA's), (24, 19369), (27, 19396), (28, 19399), (38, 19495), (39, 19510), (40, 19522), (41, 19528), (48, 19570), (54, 19645), (59, 19678), (62, 19720), (66, 19759),

Gene: Cressida\_30 Start: 18868, Stop: 19272, Start Num: 21

Candidate Starts for Cressida\_30:

(Start: 21 @18868 has 55 MA's), (26, 18889), (28, 18907), (32, 18925), (38, 19003), (39, 19018), (41, 19036), (42, 19042), (48, 19078), (54, 19153), (61, 19207), (62, 19225), (63, 19237), (66, 19264),

Gene: Crisis\_34 Start: 19345, Stop: 19749, Start Num: 21

Candidate Starts for Crisis\_34:

(Start: 21 @19345 has 55 MA's), (24, 19354), (27, 19381), (28, 19384), (38, 19480), (39, 19495), (40, 19507), (41, 19513), (48, 19555), (54, 19630), (59, 19663), (62, 19705), (66, 19744),

Gene: Dewdrop\_73 Start: 39864, Stop: 40274, Start Num: 21

Candidate Starts for Dewdrop\_73:

(6, 39612), (10, 39717), (13, 39774), (Start: 21 @39864 has 55 MA's), (26, 39888), (39, 40017), (44, 40044), (48, 40080), (50, 40140), (56, 40182), (62, 40227), (64, 40248),

Gene: EarickHC\_33 Start: 19271, Stop: 19675, Start Num: 21

Candidate Starts for EarickHC\_33:

(Start: 21 @19271 has 55 MA's), (24, 19280), (27, 19307), (28, 19310), (38, 19406), (39, 19421), (40, 19433), (41, 19439), (48, 19481), (54, 19556), (59, 19589), (62, 19631), (66, 19670),

Gene: Fireman\_33 Start: 19161, Stop: 19565, Start Num: 21

Candidate Starts for Fireman\_33:

(Start: 21 @19161 has 55 MA's), (25, 19176), (27, 19197), (28, 19200), (39, 19311), (40, 19323), (41, 19329), (48, 19371), (53, 19443), (54, 19446), (59, 19479), (62, 19521), (66, 19560),

Gene: FuzzBuster\_37 Start: 19497, Stop: 19925, Start Num: 21

Candidate Starts for FuzzBuster\_37:

(Start: 21 @19497 has 55 MA's), (25, 19509), (28, 19533), (31, 19542), (33, 19587), (37, 19611), (39, 19644), (41, 19662), (43, 19671), (47, 19707), (52, 19791), (54, 19803), (60, 19851), (62, 19878), (65, 19905),

Gene: Ganandorf\_32 Start: 19407, Stop: 19811, Start Num: 21

Candidate Starts for Ganandorf\_32:

(Start: 21 @19407 has 55 MA's), (24, 19416), (27, 19443), (28, 19446), (38, 19542), (39, 19557), (40, 19569), (41, 19575), (48, 19617), (54, 19692), (59, 19725), (62, 19767), (66, 19806),

Gene: Germa\_34 Start: 19236, Stop: 19640, Start Num: 21

Candidate Starts for Germa\_34:

(Start: 21 @19236 has 55 MA's), (24, 19245), (27, 19272), (28, 19275), (38, 19371), (39, 19386), (40, 19398), (41, 19404), (48, 19446), (54, 19521), (59, 19554), (62, 19596), (66, 19635),

Gene: Gina\_34 Start: 19178, Stop: 19588, Start Num: 19

Candidate Starts for Gina\_34:

(Start: 19 @19178 has 2 MA's), (Start: 21 @19184 has 55 MA's), (25, 19199), (39, 19334), (40, 19346), (48, 19394), (53, 19466), (54, 19469), (59, 19502), (60, 19517), (62, 19544), (66, 19583),

Gene: Glorp\_34 Start: 19408, Stop: 19812, Start Num: 21

Candidate Starts for Glorp\_34:

(Start: 21 @19408 has 55 MA's), (24, 19417), (27, 19444), (28, 19447), (38, 19543), (39, 19558), (40, 19570), (41, 19576), (48, 19618), (54, 19693), (59, 19726), (62, 19768), (66, 19807),

Gene: Hendrix\_67 Start: 39133, Stop: 39537, Start Num: 20

Candidate Starts for Hendrix\_67:

(Start: 20 @39133 has 1 MA's), (38, 39268), (39, 39283), (62, 39493), (64, 39514), (65, 39520), (66, 39532),

Gene: Hermeonysus\_32 Start: 19280, Stop: 19684, Start Num: 21

Candidate Starts for Hermeonysus\_32:

(Start: 21 @19280 has 55 MA's), (24, 19289), (27, 19316), (28, 19319), (38, 19415), (39, 19430), (40, 19442), (41, 19448), (48, 19490), (54, 19565), (59, 19598), (62, 19640), (66, 19679),

Gene: Honeyfin\_34 Start: 19595, Stop: 19999, Start Num: 21

Candidate Starts for Honeyfin\_34:

(Start: 21 @19595 has 55 MA's), (24, 19604), (27, 19631), (28, 19634), (38, 19730), (39, 19745), (40, 19757), (41, 19763), (48, 19805), (54, 19880), (59, 19913), (62, 19955), (66, 19994),

Gene: Jayden\_34 Start: 19325, Stop: 19741, Start Num: 18

Candidate Starts for Jayden\_34:

(Start: 18 @19325 has 1 MA's), (Start: 19 @19331 has 2 MA's), (39, 19487), (40, 19499), (41, 19505), (48, 19547), (53, 19619), (54, 19622), (59, 19655), (60, 19670), (62, 19697), (66, 19736),

Gene: Jefe\_33 Start: 19332, Stop: 19736, Start Num: 21

Candidate Starts for Jefe\_33:

(Start: 21 @19332 has 55 MA's), (24, 19341), (27, 19368), (28, 19371), (38, 19467), (39, 19482), (40, 19494), (41, 19500), (48, 19542), (54, 19617), (59, 19650), (62, 19692), (66, 19731),

Gene: Jollipop\_33 Start: 19677, Stop: 20081, Start Num: 21

Candidate Starts for Jollipop\_33:

(Start: 21 @19677 has 55 MA's), (24, 19686), (27, 19713), (28, 19716), (38, 19812), (39, 19827), (40, 19839), (41, 19845), (48, 19887), (54, 19962), (59, 19995), (62, 20037), (66, 20076),

Gene: KaiHaiDragon\_33 Start: 19271, Stop: 19675, Start Num: 21

Candidate Starts for KaiHaiDragon\_33:

(Start: 21 @19271 has 55 MA's), (24, 19280), (27, 19307), (28, 19310), (38, 19406), (39, 19421), (40, 19433), (41, 19439), (48, 19481), (54, 19556), (59, 19589), (62, 19631), (66, 19670),

Gene: Kowalski\_32 Start: 19387, Stop: 19791, Start Num: 21

Candidate Starts for Kowalski\_32:

(Start: 21 @19387 has 55 MA's), (24, 19396), (27, 19423), (28, 19426), (38, 19522), (39, 19537), (40, 19549), (41, 19555), (48, 19597), (54, 19672), (59, 19705), (62, 19747), (66, 19786),

Gene: Kozie\_29 Start: 19096, Stop: 19503, Start Num: 21

Candidate Starts for Kozie\_29:

(Start: 21 @19096 has 55 MA's), (25, 19111), (32, 19153), (36, 19204), (39, 19246), (41, 19264), (49, 19330), (53, 19378), (54, 19381), (55, 19384), (59, 19414), (60, 19429), (62, 19456), (66, 19495),

Gene: Leaf\_73 Start: 39864, Stop: 40274, Start Num: 21

Candidate Starts for Leaf\_73:

(6, 39612), (10, 39717), (13, 39774), (Start: 21 @39864 has 55 MA's), (26, 39888), (39, 40017), (44, 40044), (48, 40080), (50, 40140), (56, 40182), (62, 40227), (64, 40248),

Gene: LittleFortune\_34 Start: 19637, Stop: 20041, Start Num: 21

Candidate Starts for LittleFortune\_34:

(Start: 21 @19637 has 55 MA's), (24, 19646), (27, 19673), (28, 19676), (38, 19772), (39, 19787), (40, 19799), (41, 19805), (48, 19847), (54, 19922), (59, 19955), (62, 19997), (66, 20036),

Gene: Lucretia\_33 Start: 19324, Stop: 19728, Start Num: 21

Candidate Starts for Lucretia\_33:

(Start: 21 @19324 has 55 MA's), (24, 19333), (27, 19360), (28, 19363), (38, 19459), (39, 19474), (40, 19486), (41, 19492), (48, 19534), (54, 19609), (59, 19642), (62, 19684), (66, 19723),

Gene: Margaery\_28 Start: 18750, Stop: 19154, Start Num: 21

Candidate Starts for Margaery\_28:

(7, 18570), (Start: 21 @18750 has 55 MA's), (25, 18765), (26, 18771), (32, 18807), (38, 18885), (39, 18900), (41, 18918), (54, 19035), (55, 19038), (59, 19065), (61, 19089), (62, 19107), (66, 19146),

Gene: Matzah\_29 Start: 18786, Stop: 19190, Start Num: 21

Candidate Starts for Matzah\_29:

(14, 18723), (Start: 21 @18786 has 55 MA's), (24, 18795), (26, 18807), (28, 18825), (32, 18843), (39, 18936), (41, 18954), (42, 18960), (48, 18996), (49, 19020), (53, 19068), (54, 19071), (58, 19098), (59, 19101), (61, 19125), (62, 19143), (63, 19155), (66, 19182),

Gene: Megan\_27 Start: 20591, Stop: 20995, Start Num: 23

Candidate Starts for Megan\_27:

(5, 20315), (Start: 23 @20591 has 1 MA's), (27, 20624), (38, 20723), (39, 20738), (41, 20756), (48, 20798), (49, 20822), (54, 20873), (55, 20876), (59, 20906), (60, 20921), (61, 20930), (62, 20948), (63, 20960), (64, 20969), (65, 20975), (66, 20987),

Gene: MementoMori\_29 Start: 18515, Stop: 18919, Start Num: 21

Candidate Starts for MementoMori\_29:

(Start: 21 @18515 has 55 MA's), (24, 18524), (26, 18536), (28, 18554), (32, 18572), (38, 18650), (39, 18665), (41, 18683), (42, 18689), (48, 18725), (49, 18749), (53, 18797), (54, 18800), (59, 18830), (61, 18854), (62, 18872), (63, 18884), (66, 18911),

Gene: Merry\_ Start: 21444, Stop: 21854, Start Num: 21

Candidate Starts for Merry\_:

(Start: 19 @21438 has 2 MA's), (Start: 21 @21444 has 55 MA's), (38, 21585), (39, 21600), (40, 21612), (41, 21618), (48, 21660), (59, 21768), (62, 21810), (64, 21831),

Gene: Metamorphoo\_33 Start: 19183, Stop: 19590, Start Num: 21

Candidate Starts for Metamorphoo\_33:

(Start: 21 @19183 has 55 MA's), (39, 19336), (40, 19348), (41, 19354), (48, 19396), (53, 19468), (54, 19471), (59, 19504), (60, 19519), (62, 19546), (66, 19585),

Gene: MisoSoup\_24 Start: 15370, Stop: 15780, Start Num: 21

Candidate Starts for MisoSoup\_24:

(Start: 21 @15370 has 55 MA's), (33, 15463), (36, 15478), (39, 15520), (41, 15538), (48, 15583), (51, 15643), (57, 15688), (62, 15733), (63, 15745),

Gene: Nicole72\_28 Start: 20957, Stop: 21364, Start Num: 22

Candidate Starts for Nicole72\_28:

(Start: 22 @20957 has 1 MA's), (35, 21062), (36, 21065), (38, 21092), (39, 21107), (40, 21119), (41, 21125), (46, 21152), (48, 21167), (54, 21242), (55, 21245), (59, 21275), (62, 21317), (64, 21338), (66, 21356),

Gene: NoodlelyBoi\_33 Start: 19715, Stop: 20119, Start Num: 21

Candidate Starts for NoodlelyBoi\_33:

(Start: 21 @19715 has 55 MA's), (24, 19724), (27, 19751), (28, 19754), (38, 19850), (39, 19865), (40, 19877), (41, 19883), (48, 19925), (53, 19997), (54, 20000), (59, 20033), (62, 20075), (66, 20114),

Gene: Onika\_32 Start: 19362, Stop: 19766, Start Num: 21

Candidate Starts for Onika\_32:

(Start: 21 @19362 has 55 MA's), (24, 19371), (27, 19398), (28, 19401), (38, 19497), (39, 19512), (40, 19524), (41, 19530), (48, 19572), (54, 19647), (59, 19680), (62, 19722), (66, 19761),

Gene: Paschalis\_32 Start: 19375, Stop: 19779, Start Num: 21

Candidate Starts for Paschalis\_32:

(Start: 21 @19375 has 55 MA's), (24, 19384), (27, 19411), (28, 19414), (38, 19510), (39, 19525), (40, 19537), (41, 19543), (48, 19585), (54, 19660), (59, 19693), (62, 19735), (66, 19774),

Gene: PhedwardCullen\_32 Start: 19120, Stop: 19524, Start Num: 21

Candidate Starts for PhedwardCullen\_32:

(Start: 21 @19120 has 55 MA's), (24, 19129), (27, 19156), (28, 19159), (38, 19255), (39, 19270), (40, 19282), (41, 19288), (48, 19330), (54, 19405), (59, 19438), (62, 19480), (66, 19519),

Gene: Phorgeous\_32 Start: 19229, Stop: 19633, Start Num: 21

Candidate Starts for Phorgeous\_32:

(Start: 21 @19229 has 55 MA's), (24, 19238), (27, 19265), (28, 19268), (38, 19364), (39, 19379), (40, 19391), (41, 19397), (48, 19439), (54, 19514), (59, 19547), (62, 19589), (66, 19628),

Gene: Phrancesco\_33 Start: 19507, Stop: 19911, Start Num: 21

Candidate Starts for Phrancesco\_33:

(Start: 21 @19507 has 55 MA's), (24, 19516), (27, 19543), (28, 19546), (38, 19642), (39, 19657), (40, 19669), (41, 19675), (48, 19717), (54, 19792), (59, 19825), (62, 19867), (66, 19906),

Gene: PierreOrion\_33 Start: 19530, Stop: 19934, Start Num: 21

Candidate Starts for PierreOrion\_33:

(Start: 21 @19530 has 55 MA's), (24, 19539), (27, 19566), (28, 19569), (38, 19665), (39, 19680), (40, 19692), (41, 19698), (48, 19740), (54, 19815), (59, 19848), (62, 19890), (66, 19929),

Gene: PiperSansNom\_33 Start: 19682, Stop: 20086, Start Num: 21

Candidate Starts for PiperSansNom\_33:

(Start: 21 @19682 has 55 MA's), (24, 19691), (27, 19718), (28, 19721), (38, 19817), (39, 19832), (40, 19844), (41, 19850), (48, 19892), (54, 19967), (59, 20000), (62, 20042), (66, 20081),

Gene: Piperis\_33 Start: 19352, Stop: 19756, Start Num: 21

Candidate Starts for Piperis\_33:

(Start: 21 @19352 has 55 MA's), (24, 19361), (27, 19388), (28, 19391), (38, 19487), (39, 19502), (40, 19514), (41, 19520), (48, 19562), (54, 19637), (59, 19670), (62, 19712), (66, 19751),

Gene: Pulchra\_34 Start: 19752, Stop: 20156, Start Num: 21

Candidate Starts for Pulchra\_34:

(Start: 21 @19752 has 55 MA's), (24, 19761), (27, 19788), (28, 19791), (38, 19887), (39, 19902), (40, 19914), (41, 19920), (48, 19962), (54, 20037), (59, 20070), (62, 20112), (66, 20151),

Gene: Quhwah\_36 Start: 19978, Stop: 20382, Start Num: 21

Candidate Starts for Quhwah\_36:

(Start: 21 @19978 has 55 MA's), (24, 19987), (27, 20014), (28, 20017), (39, 20128), (40, 20140), (41, 20146), (48, 20188), (54, 20263), (59, 20296), (62, 20338), (66, 20377),

Gene: Ramiel05\_32 Start: 19387, Stop: 19791, Start Num: 21

Candidate Starts for Ramiel05\_32:

(Start: 21 @19387 has 55 MA's), (24, 19396), (27, 19423), (28, 19426), (38, 19522), (39, 19537), (40, 19549), (41, 19555), (48, 19597), (54, 19672), (59, 19705), (62, 19747), (66, 19786),

Gene: Rasputia\_68 Start: 39096, Stop: 39503, Start Num: 21

Candidate Starts for Rasputia\_68:

(13, 39006), (17, 39072), (Start: 21 @39096 has 55 MA's), (25, 39111), (34, 39192), (37, 39213), (38, 39231), (39, 39246), (44, 39273), (48, 39309), (62, 39459), (64, 39480), (65, 39486), (66, 39498),

Gene: RobsFeet\_34 Start: 19464, Stop: 19871, Start Num: 21

Candidate Starts for RobsFeet\_34:

(Start: 21 @19464 has 55 MA's), (39, 19617), (40, 19629), (41, 19635), (48, 19677), (53, 19749), (54, 19752), (59, 19785), (60, 19800), (62, 19827), (66, 19866),

Gene: Rockwell\_32 Start: 19387, Stop: 19791, Start Num: 21

Candidate Starts for Rockwell\_32:

(Start: 21 @19387 has 55 MA's), (24, 19396), (27, 19423), (28, 19426), (38, 19522), (39, 19537), (40, 19549), (41, 19555), (48, 19597), (54, 19672), (59, 19705), (62, 19747), (66, 19786),

Gene: Savannah\_32 Start: 19414, Stop: 19818, Start Num: 21

Candidate Starts for Savannah\_32:

(Start: 21 @19414 has 55 MA's), (24, 19423), (27, 19450), (28, 19453), (38, 19549), (39, 19564), (40, 19576), (41, 19582), (48, 19624), (54, 19699), (59, 19732), (62, 19774), (66, 19813),

Gene: Scumberland\_34 Start: 19603, Stop: 20007, Start Num: 21

Candidate Starts for Scumberland\_34:

(Start: 21 @19603 has 55 MA's), (24, 19612), (27, 19639), (28, 19642), (38, 19738), (39, 19753), (40, 19765), (41, 19771), (48, 19813), (54, 19888), (59, 19921), (62, 19963), (66, 20002),

Gene: Selwyn23\_34 Start: 19580, Stop: 19984, Start Num: 21

Candidate Starts for Selwyn23\_34:

(Start: 21 @19580 has 55 MA's), (24, 19589), (27, 19616), (28, 19619), (38, 19715), (39, 19730), (40, 19742), (41, 19748), (48, 19790), (54, 19865), (59, 19898), (62, 19940), (66, 19979),

Gene: Shotgun\_32 Start: 19213, Stop: 19617, Start Num: 21

Candidate Starts for Shotgun\_32:

(Start: 21 @19213 has 55 MA's), (24, 19222), (27, 19249), (28, 19252), (38, 19348), (39, 19363), (40, 19375), (41, 19381), (48, 19423), (54, 19498), (59, 19531), (62, 19573), (66, 19612),

Gene: Shrubaron\_33 Start: 19098, Stop: 19505, Start Num: 21

Candidate Starts for Shrubaron\_33:

(Start: 21 @19098 has 55 MA's), (27, 19137), (39, 19251), (40, 19263), (41, 19269), (48, 19311), (53, 19383), (54, 19386), (59, 19419), (60, 19434), (62, 19461), (66, 19500),

Gene: SirFrank\_32 Start: 19315, Stop: 19719, Start Num: 21

Candidate Starts for SirFrank\_32:

(Start: 21 @19315 has 55 MA's), (24, 19324), (28, 19354), (38, 19450), (39, 19465), (40, 19477), (41, 19483), (54, 19600), (59, 19633), (62, 19675), (66, 19714),

Gene: Skugga\_31 Start: 19196, Stop: 19606, Start Num: 19

Candidate Starts for Skugga\_31:

(Start: 19 @19196 has 2 MA's), (Start: 21 @19202 has 55 MA's), (25, 19217), (39, 19352), (40, 19364), (41, 19370), (45, 19394), (48, 19412), (53, 19484), (59, 19520), (62, 19562), (66, 19601),

Gene: Smarties\_41 Start: 21286, Stop: 21693, Start Num: 21

Candidate Starts for Smarties\_41:

(Start: 21 @21286 has 55 MA's), (39, 21439), (40, 21451), (48, 21499), (53, 21571), (54, 21574), (59, 21607), (60, 21622), (62, 21649), (66, 21688),

Gene: Sunny\_ Start: 21449, Stop: 21856, Start Num: 21

Candidate Starts for Sunny\_:

(Start: 21 @21449 has 55 MA's), (38, 21587), (39, 21602), (40, 21614), (41, 21620), (48, 21662), (59, 21770), (62, 21812), (64, 21833),

Gene: Teamocil\_34 Start: 19277, Stop: 19687, Start Num: 19

Candidate Starts for Teamocil\_34:

(Start: 19 @19277 has 2 MA's), (Start: 21 @19283 has 55 MA's), (25, 19298), (39, 19433), (40, 19445), (48, 19493), (53, 19565), (54, 19568), (59, 19601), (60, 19616), (62, 19643), (66, 19682),

Gene: Terij\_29 Start: 18831, Stop: 19235, Start Num: 21

Candidate Starts for Terij\_29:

(1, 18411), (2, 18423), (3, 18513), (4, 18546), (8, 18663), (9, 18672), (11, 18699), (12, 18741), (15, 18774), (16, 18792), (Start: 21 @18831 has 55 MA's), (26, 18852), (29, 18873), (32, 18888), (38, 18966), (39, 18981), (54, 19116), (55, 19119), (59, 19146), (62, 19188), (63, 19200),

Gene: Tyrumbra\_31 Start: 18504, Stop: 18908, Start Num: 21

Candidate Starts for Tyrumbra\_31:

(Start: 21 @18504 has 55 MA's), (25, 18519), (28, 18543), (39, 18654), (40, 18666), (41, 18672), (48, 18714), (53, 18786), (54, 18789), (59, 18822), (62, 18864), (66, 18903),

Gene: Yeti\_33 Start: 19382, Stop: 19786, Start Num: 21

Candidate Starts for Yeti\_33:

(Start: 21 @19382 has 55 MA's), (24, 19391), (27, 19418), (28, 19421), (38, 19517), (39, 19532), (40, 19544), (41, 19550), (48, 19592), (54, 19667), (59, 19700), (62, 19742), (66, 19781),

Gene: Zapato\_32 Start: 19227, Stop: 19631, Start Num: 21

Candidate Starts for Zapato\_32:

(Start: 21 @19227 has 55 MA's), (30, 19272), (39, 19377), (40, 19389), (41, 19395), (48, 19437), (53, 19509), (54, 19512), (59, 19545), (62, 19587), (66, 19626),