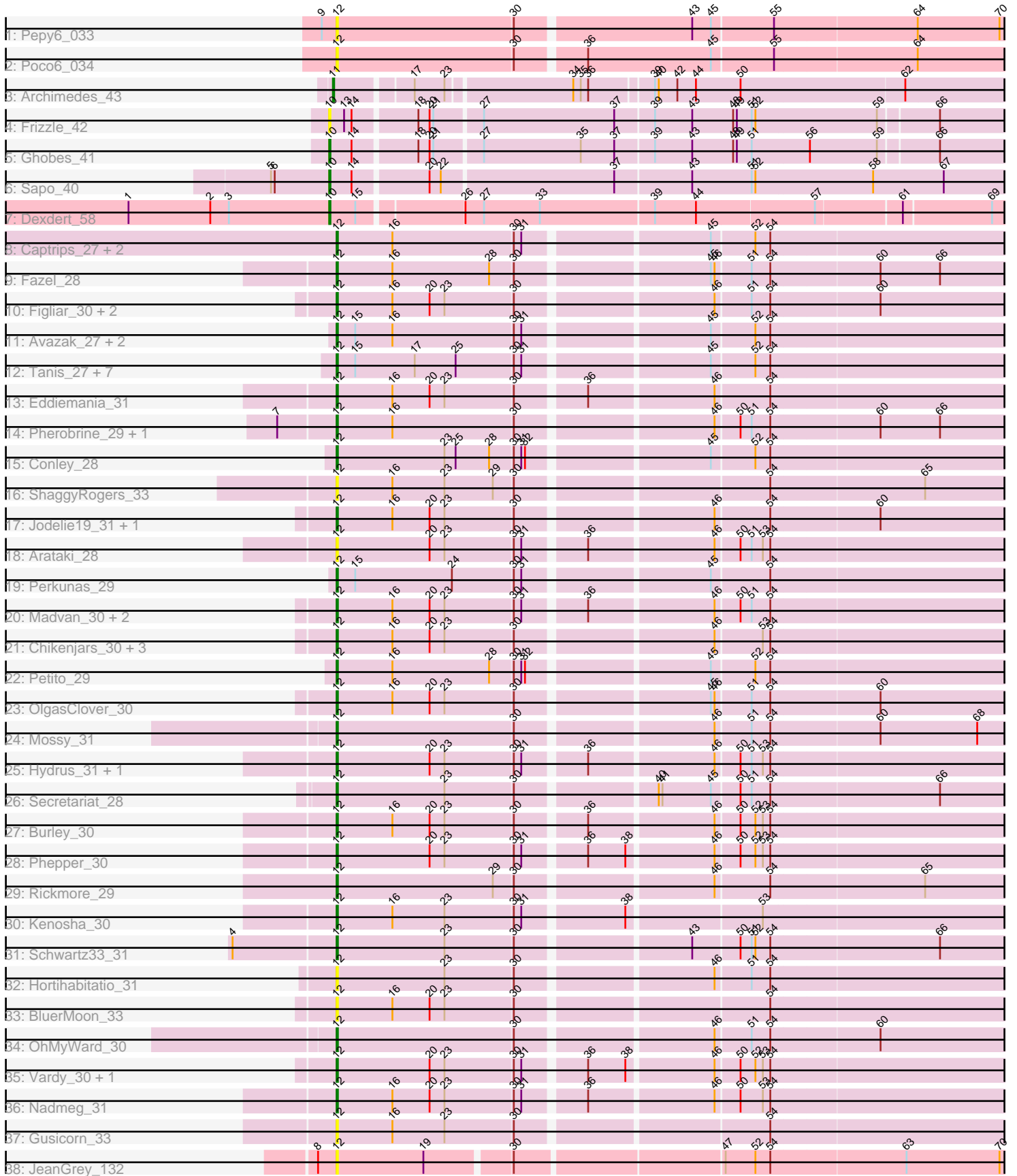


# Zoomed Pham 194026



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 194026 Report

This analysis was run 11/02/24 on database version 579.

Pham number 194026 has 60 members, 12 are drafts.

Phages represented in each track:

- Track 1 : Pepy6\_033
- Track 2 : Poco6\_034
- Track 3 : Archimedes\_43
- Track 4 : Frizzle\_42
- Track 5 : Ghobes\_41
- Track 6 : Sapo\_40
- Track 7 : Dexdert\_58
- Track 8 : Captrips\_27, NoPickles\_27, JulesRay\_29
- Track 9 : Fazel\_28
- Track 10 : Figliar\_30, Duffington\_30, Aflac\_30
- Track 11 : Avazak\_27, FortCran\_27, Artorias\_27
- Track 12 : Tanis\_27, Capybara\_27, Gravy\_27, Gill\_27, Odesza\_27, Magel\_27, Kerry\_27, Roney\_27
- Track 13 : Eddiemania\_31
- Track 14 : Pherobrine\_29, Mysticmoon\_30
- Track 15 : Conley\_28
- Track 16 : ShaggyRogers\_33
- Track 17 : Jodelie19\_31, TenaciousP\_31
- Track 18 : Arataki\_28
- Track 19 : Perkunas\_29
- Track 20 : Madvan\_30, Crocheter\_30, Untouchable\_30
- Track 21 : Chikenjars\_30, Nithya\_30, EndAve\_30, AlainaMarie\_30
- Track 22 : Petite\_29
- Track 23 : OlgasClover\_30
- Track 24 : Mossy\_31
- Track 25 : Hydrus\_31, Zeph\_31
- Track 26 : Secretariat\_28
- Track 27 : Burley\_30
- Track 28 : Phepper\_30
- Track 29 : Rickmore\_29
- Track 30 : Kenosha\_30
- Track 31 : Schwartz33\_31
- Track 32 : Hortihabitatio\_31
- Track 33 : BluerMoon\_33
- Track 34 : OhMyWard\_30
- Track 35 : Vardy\_30, Runhaar\_30
- Track 36 : Nadmeg\_31

- Track 37 : Gusicorn\_33
- Track 38 : JeanGrey\_132

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

The start number called the most often in the published annotations is 12, it was called in 44 of the 48 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aflac\_30, AlainaMarie\_30, Arataki\_28, Artorias\_27, Avazak\_27, BluerMoon\_33, Burley\_30, Captrips\_27, Copybara\_27, Chikenjars\_30, Conley\_28, Crocheter\_30, Duffington\_30, Eddiemania\_31, EndAve\_30, Fazel\_28, Figliar\_30, FortCran\_27, Gill\_27, Gravy\_27, Gusicorn\_33, Hortihabitatio\_31, Hydrus\_31, JeanGrey\_132, Jodelie19\_31, JulesRay\_29, Kenosha\_30, Kerry\_27, Madvan\_30, Magel\_27, Mossy\_31, Mysticmoon\_30, Nadmeg\_31, Nithya\_30, NoPickles\_27, Odesza\_27, OhMyWard\_30, OlgasClover\_30, Pepy6\_033, Perkunas\_29, Petite\_29, Phepper\_30, Pherobrine\_29, Poco6\_034, Rickmore\_29, Roney\_27, Runhaar\_30, Schwartz33\_31, Secretariat\_28, ShaggyRogers\_33, Tanis\_27, TenaciousP\_31, Untouchable\_30, Vardy\_30, Zeph\_31,

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

- 

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

- Archimedes\_43, Dexdert\_58, Frizzle\_42, Ghobes\_41, Sapo\_40,

**Summary by start number:**

Start 10:

- Found in 4 of 60 ( 6.7% ) of genes in pham
- Manual Annotations of this start: 3 of 48
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Dexdert\_58 (DE3), Frizzle\_42 (DA), Ghobes\_41 (DA), Sapo\_40 (DA),

Start 11:

- Found in 1 of 60 ( 1.7% ) of genes in pham
- Manual Annotations of this start: 1 of 48
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Archimedes\_43 (DA),

Start 12:

- Found in 55 of 60 ( 91.7% ) of genes in pham
- Manual Annotations of this start: 44 of 48
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Aflac\_30 (DJ), AlainaMarie\_30 (DJ), Arataki\_28 (DJ), Artorias\_27 (DJ), Avazak\_27 (DJ), BluerMoon\_33 (DJ), Burley\_30 (DJ), Captrips\_27 (DJ), Copybara\_27 (DJ), Chikenjars\_30 (DJ), Conley\_28 (DJ), Crocheter\_30 (DJ), Duffington\_30 (DJ), Eddiemania\_31 (DJ), EndAve\_30 (DJ), Fazel\_28 (DJ), Figliar\_30 (DJ), FortCran\_27 (DJ), Gill\_27 (DJ), Gravy\_27 (DJ),

Gusicorn\_33 (DJ), Hortihabitatio\_31 (DJ), Hydrus\_31 (DJ), JeanGrey\_132 (singleton), Jodelie19\_31 (DJ), JulesRay\_29 (DJ), Kenosha\_30 (DJ), Kerry\_27 (DJ), Madvan\_30 (DJ), Magel\_27 (DJ), Mossy\_31 (DJ), Mysticmoon\_30 (DJ), Nadmeg\_31 (DJ), Nithya\_30 (DJ), NoPickles\_27 (DJ), Odesza\_27 (DJ), OhMyWard\_30 (DJ), OlgasClover\_30 (DJ), Pepy6\_033 (CC), Perkunas\_29 (DJ), Petite\_29 (DJ), Phepper\_30 (DJ), Pherobrine\_29 (DJ), Poco6\_034 (CC), Rickmore\_29 (DJ), Roney\_27 (DJ), Runhaar\_30 (DJ), Schwartz33\_31 (DJ), Secretariat\_28 (DJ), ShaggyRogers\_33 (DJ), Tanis\_27 (DJ), TenaciousP\_31 (DJ), Untouchable\_30 (DJ), Vardy\_30 (DJ), Zeph\_31 (DJ),

### **Summary by clusters:**

There are 5 clusters represented in this pham: CC, singleton, DE3, DJ, DA,

Info for manual annotations of cluster DA:

- Start number 10 was manually annotated 2 times for cluster DA.
- Start number 11 was manually annotated 1 time for cluster DA.

Info for manual annotations of cluster DE3:

- Start number 10 was manually annotated 1 time for cluster DE3.

Info for manual annotations of cluster DJ:

- Start number 12 was manually annotated 44 times for cluster DJ.

### **Gene Information:**

Gene: Aflac\_30 Start: 22320, Stop: 23108, Start Num: 12

Candidate Starts for Aflac\_30:

(Start: 12 @22320 has 44 MA's), (16, 22365), (20, 22395), (23, 22407), (30, 22461), (46, 22608), (51, 22635), (54, 22650), (60, 22734), (71, 22839), (72, 22842), (79, 22917), (91, 23064),

Gene: AlainaMarie\_30 Start: 22307, Stop: 23095, Start Num: 12

Candidate Starts for AlainaMarie\_30:

(Start: 12 @22307 has 44 MA's), (16, 22352), (20, 22382), (23, 22394), (30, 22448), (46, 22595), (53, 22631), (54, 22637), (71, 22826), (72, 22829), (77, 22886), (79, 22904), (84, 22931), (91, 23051),

Gene: Arataki\_28 Start: 21413, Stop: 22201, Start Num: 12

Candidate Starts for Arataki\_28:

(Start: 12 @21413 has 44 MA's), (20, 21488), (23, 21500), (30, 21554), (31, 21560), (36, 21605), (46, 21701), (50, 21719), (51, 21728), (53, 21737), (54, 21743), (71, 21932), (72, 21935), (74, 21950), (84, 22037), (91, 22157),

Gene: Archimedes\_43 Start: 37658, Stop: 38419, Start Num: 11

Candidate Starts for Archimedes\_43:

(Start: 11 @37658 has 1 MA's), (17, 37715), (23, 37739), (34, 37835), (35, 37841), (36, 37847), (39, 37895), (40, 37898), (42, 37913), (44, 37928), (50, 37964), (62, 38093), (81, 38264), (86, 38291),

Gene: Artorias\_27 Start: 19318, Stop: 20103, Start Num: 12

Candidate Starts for Artorias\_27:

(Start: 12 @19318 has 44 MA's), (15, 19333), (16, 19363), (30, 19459), (31, 19465), (45, 19603), (52, 19636), (54, 19648), (71, 19837), (72, 19840), (79, 19915), (91, 20062),

Gene: Avazak\_27 Start: 19325, Stop: 20110, Start Num: 12

Candidate Starts for Avazak\_27:

(Start: 12 @19325 has 44 MA's), (15, 19340), (16, 19370), (30, 19466), (31, 19472), (45, 19610), (52, 19643), (54, 19655), (71, 19844), (72, 19847), (79, 19922), (91, 20069),

Gene: BluerMoon\_33 Start: 22314, Stop: 23105, Start Num: 12

Candidate Starts for BluerMoon\_33:

(Start: 12 @22314 has 44 MA's), (16, 22359), (20, 22389), (23, 22401), (30, 22455), (54, 22644), (71, 22833), (72, 22836), (79, 22911),

Gene: Burley\_30 Start: 22058, Stop: 22846, Start Num: 12

Candidate Starts for Burley\_30:

(Start: 12 @22058 has 44 MA's), (16, 22103), (20, 22133), (23, 22145), (30, 22199), (36, 22250), (46, 22346), (50, 22364), (52, 22376), (53, 22382), (54, 22388), (71, 22577), (72, 22580), (79, 22655), (91, 22802),

Gene: Captrips\_27 Start: 19354, Stop: 20139, Start Num: 12

Candidate Starts for Captrips\_27:

(Start: 12 @19354 has 44 MA's), (16, 19399), (30, 19495), (31, 19501), (45, 19639), (52, 19672), (54, 19684), (71, 19873), (72, 19876), (79, 19951), (91, 20098),

Gene: Capybara\_27 Start: 19428, Stop: 20213, Start Num: 12

Candidate Starts for Capybara\_27:

(Start: 12 @19428 has 44 MA's), (15, 19443), (17, 19491), (25, 19524), (30, 19569), (31, 19575), (45, 19713), (52, 19746), (54, 19758), (71, 19947), (72, 19950), (79, 20025), (84, 20052), (91, 20172),

Gene: Chikenjars\_30 Start: 22310, Stop: 23098, Start Num: 12

Candidate Starts for Chikenjars\_30:

(Start: 12 @22310 has 44 MA's), (16, 22355), (20, 22385), (23, 22397), (30, 22451), (46, 22598), (53, 22634), (54, 22640), (71, 22829), (72, 22832), (77, 22889), (79, 22907), (84, 22934), (91, 23054),

Gene: Conley\_28 Start: 20413, Stop: 21198, Start Num: 12

Candidate Starts for Conley\_28:

(Start: 12 @20413 has 44 MA's), (23, 20500), (25, 20509), (28, 20536), (30, 20554), (31, 20560), (32, 20563), (45, 20698), (52, 20731), (54, 20743), (71, 20932), (72, 20935), (79, 21010), (83, 21028), (91, 21157),

Gene: Crocheter\_30 Start: 22450, Stop: 23238, Start Num: 12

Candidate Starts for Crocheter\_30:

(Start: 12 @22450 has 44 MA's), (16, 22495), (20, 22525), (23, 22537), (30, 22591), (31, 22597), (36, 22642), (46, 22738), (50, 22756), (51, 22765), (54, 22780), (71, 22969), (72, 22972), (74, 22987), (79, 23047), (84, 23074), (91, 23194),

Gene: Dxdert\_58 Start: 44000, Stop: 44779, Start Num: 10

Candidate Starts for Dxdert\_58:

(1, 43838), (2, 43904), (3, 43919), (Start: 10 @44000 has 3 MA's), (15, 44021), (26, 44099), (27, 44114), (33, 44159), (39, 44249), (44, 44282), (57, 44375), (61, 44441), (69, 44510), (76, 44564), (82, 44612), (93, 44765),

Gene: Duffington\_30 Start: 22295, Stop: 23083, Start Num: 12

Candidate Starts for Duffington\_30:

(Start: 12 @22295 has 44 MA's), (16, 22340), (20, 22370), (23, 22382), (30, 22436), (46, 22583), (51, 22610), (54, 22625), (60, 22709), (71, 22814), (72, 22817), (79, 22892), (91, 23039),

Gene: Eddiemania\_31 Start: 22956, Stop: 23744, Start Num: 12

Candidate Starts for Eddiemania\_31:

(Start: 12 @22956 has 44 MA's), (16, 23001), (20, 23031), (23, 23043), (30, 23097), (36, 23148), (46, 23244), (54, 23286), (71, 23475), (72, 23478), (79, 23553), (91, 23700),

Gene: EndAve\_30 Start: 22310, Stop: 23098, Start Num: 12

Candidate Starts for EndAve\_30:

(Start: 12 @22310 has 44 MA's), (16, 22355), (20, 22385), (23, 22397), (30, 22451), (46, 22598), (53, 22634), (54, 22640), (71, 22829), (72, 22832), (77, 22889), (79, 22907), (84, 22934), (91, 23054),

Gene: Fazel\_28 Start: 21344, Stop: 22132, Start Num: 12

Candidate Starts for Fazel\_28:

(Start: 12 @21344 has 44 MA's), (16, 21389), (28, 21467), (30, 21485), (45, 21629), (46, 21632), (51, 21659), (54, 21674), (60, 21758), (66, 21806), (71, 21863), (72, 21866), (78, 21935), (79, 21941), (85, 21971),

Gene: Figliar\_30 Start: 22320, Stop: 23108, Start Num: 12

Candidate Starts for Figliar\_30:

(Start: 12 @22320 has 44 MA's), (16, 22365), (20, 22395), (23, 22407), (30, 22461), (46, 22608), (51, 22635), (54, 22650), (60, 22734), (71, 22839), (72, 22842), (79, 22917), (91, 23064),

Gene: FortCran\_27 Start: 19318, Stop: 20103, Start Num: 12

Candidate Starts for FortCran\_27:

(Start: 12 @19318 has 44 MA's), (15, 19333), (16, 19363), (30, 19459), (31, 19465), (45, 19603), (52, 19636), (54, 19648), (71, 19837), (72, 19840), (79, 19915), (91, 20062),

Gene: Frizzle\_42 Start: 36518, Stop: 37297, Start Num: 10

Candidate Starts for Frizzle\_42:

(Start: 10 @36518 has 3 MA's), (13, 36530), (14, 36536), (18, 36584), (20, 36593), (21, 36596), (27, 36632), (37, 36737), (39, 36767), (43, 36797), (48, 36830), (49, 36833), (51, 36845), (52, 36848), (59, 36944), (66, 36989), (89, 37235), (91, 37259),

Gene: Ghobes\_41 Start: 36518, Stop: 37297, Start Num: 10

Candidate Starts for Ghobes\_41:

(Start: 10 @36518 has 3 MA's), (14, 36536), (18, 36584), (20, 36593), (21, 36596), (27, 36632), (35, 36710), (37, 36737), (39, 36767), (43, 36797), (48, 36830), (49, 36833), (51, 36845), (56, 36890), (59, 36944), (66, 36989), (89, 37235), (91, 37259),

Gene: Gill\_27 Start: 19428, Stop: 20213, Start Num: 12

Candidate Starts for Gill\_27:

(Start: 12 @19428 has 44 MA's), (15, 19443), (17, 19491), (25, 19524), (30, 19569), (31, 19575), (45, 19713), (52, 19746), (54, 19758), (71, 19947), (72, 19950), (79, 20025), (84, 20052), (91, 20172),

Gene: Gravy\_27 Start: 19428, Stop: 20213, Start Num: 12

Candidate Starts for Gravy\_27:

(Start: 12 @19428 has 44 MA's), (15, 19443), (17, 19491), (25, 19524), (30, 19569), (31, 19575), (45, 19713), (52, 19746), (54, 19758), (71, 19947), (72, 19950), (79, 20025), (84, 20052), (91, 20172),

Gene: Gusicorn\_33 Start: 22097, Stop: 22885, Start Num: 12

Candidate Starts for Gusicorn\_33:

(Start: 12 @22097 has 44 MA's), (16, 22142), (23, 22184), (30, 22238), (54, 22427), (71, 22616), (72, 22619), (79, 22694), (91, 22841),

Gene: Hortihabitatio\_31 Start: 21725, Stop: 22510, Start Num: 12

Candidate Starts for Hortihabitatio\_31:

(Start: 12 @21725 has 44 MA's), (23, 21812), (30, 21866), (46, 22013), (51, 22040), (54, 22055), (71, 22244), (72, 22247), (79, 22322), (85, 22352),

Gene: Hydrus\_31 Start: 22825, Stop: 23613, Start Num: 12

Candidate Starts for Hydrus\_31:

(Start: 12 @22825 has 44 MA's), (20, 22900), (23, 22912), (30, 22966), (31, 22972), (36, 23017), (46, 23113), (50, 23131), (51, 23140), (53, 23149), (54, 23155), (71, 23344), (72, 23347), (74, 23362), (79, 23422), (91, 23569),

Gene: JeanGrey\_132 Start: 99191, Stop: 99985, Start Num: 12

Candidate Starts for JeanGrey\_132:

(8, 99176), (Start: 12 @99191 has 44 MA's), (19, 99260), (30, 99323), (47, 99482), (52, 99506), (54, 99518), (63, 99623), (70, 99698), (74, 99725), (77, 99767), (80, 99788), (83, 99803), (91, 99935), (94, 99959), (95, 99968),

Gene: Jodelie19\_31 Start: 23744, Stop: 24532, Start Num: 12

Candidate Starts for Jodelie19\_31:

(Start: 12 @23744 has 44 MA's), (16, 23789), (20, 23819), (23, 23831), (30, 23885), (46, 24032), (54, 24074), (60, 24158), (71, 24263), (72, 24266), (79, 24341), (91, 24488),

Gene: JulesRay\_29 Start: 19348, Stop: 20133, Start Num: 12

Candidate Starts for JulesRay\_29:

(Start: 12 @19348 has 44 MA's), (16, 19393), (30, 19489), (31, 19495), (45, 19633), (52, 19666), (54, 19678), (71, 19867), (72, 19870), (79, 19945), (91, 20092),

Gene: Kenosha\_30 Start: 22860, Stop: 23648, Start Num: 12

Candidate Starts for Kenosha\_30:

(Start: 12 @22860 has 44 MA's), (16, 22905), (23, 22947), (30, 23001), (31, 23007), (38, 23082), (53, 23184), (71, 23379), (72, 23382), (74, 23397), (79, 23457), (84, 23484), (91, 23604),

Gene: Kerry\_27 Start: 19428, Stop: 20213, Start Num: 12

Candidate Starts for Kerry\_27:

(Start: 12 @19428 has 44 MA's), (15, 19443), (17, 19491), (25, 19524), (30, 19569), (31, 19575), (45, 19713), (52, 19746), (54, 19758), (71, 19947), (72, 19950), (79, 20025), (84, 20052), (91, 20172),

Gene: Madvan\_30 Start: 22092, Stop: 22880, Start Num: 12

Candidate Starts for Madvan\_30:

(Start: 12 @22092 has 44 MA's), (16, 22137), (20, 22167), (23, 22179), (30, 22233), (31, 22239), (36, 22284), (46, 22380), (50, 22398), (51, 22407), (54, 22422), (71, 22611), (72, 22614), (74, 22629), (79, 22689), (84, 22716), (91, 22836),

Gene: Magel\_27 Start: 19428, Stop: 20213, Start Num: 12

Candidate Starts for Magel\_27:

(Start: 12 @19428 has 44 MA's), (15, 19443), (17, 19491), (25, 19524), (30, 19569), (31, 19575), (45, 19713), (52, 19746), (54, 19758), (71, 19947), (72, 19950), (79, 20025), (84, 20052), (91, 20172),

Gene: Mossy\_31 Start: 23518, Stop: 24303, Start Num: 12

Candidate Starts for Mossy\_31:

(Start: 12 @23518 has 44 MA's), (30, 23659), (46, 23806), (51, 23833), (54, 23848), (60, 23932), (68, 24010), (71, 24037), (72, 24040), (79, 24115), (85, 24145),

Gene: Mysticmoon\_30 Start: 22127, Stop: 22912, Start Num: 12

Candidate Starts for Mysticmoon\_30:

(7, 22082), (Start: 12 @22127 has 44 MA's), (16, 22172), (30, 22268), (46, 22415), (50, 22433), (51, 22442), (54, 22457), (60, 22541), (66, 22589), (72, 22649), (79, 22724),

Gene: Nadmeg\_31 Start: 23523, Stop: 24311, Start Num: 12

Candidate Starts for Nadmeg\_31:

(Start: 12 @23523 has 44 MA's), (16, 23568), (20, 23598), (23, 23610), (30, 23664), (31, 23670), (36, 23715), (46, 23811), (50, 23829), (53, 23847), (54, 23853), (71, 24042), (72, 24045), (75, 24081), (79, 24120), (84, 24147), (91, 24267),

Gene: Nithya\_30 Start: 22307, Stop: 23095, Start Num: 12

Candidate Starts for Nithya\_30:

(Start: 12 @22307 has 44 MA's), (16, 22352), (20, 22382), (23, 22394), (30, 22448), (46, 22595), (53, 22631), (54, 22637), (71, 22826), (72, 22829), (77, 22886), (79, 22904), (84, 22931), (91, 23051),

Gene: NoPickles\_27 Start: 19073, Stop: 19858, Start Num: 12

Candidate Starts for NoPickles\_27:

(Start: 12 @19073 has 44 MA's), (16, 19118), (30, 19214), (31, 19220), (45, 19358), (52, 19391), (54, 19403), (71, 19592), (72, 19595), (79, 19670), (91, 19817),

Gene: Odesza\_27 Start: 19428, Stop: 20213, Start Num: 12

Candidate Starts for Odesza\_27:

(Start: 12 @19428 has 44 MA's), (15, 19443), (17, 19491), (25, 19524), (30, 19569), (31, 19575), (45, 19713), (52, 19746), (54, 19758), (71, 19947), (72, 19950), (79, 20025), (84, 20052), (91, 20172),

Gene: OhMyWard\_30 Start: 22858, Stop: 23643, Start Num: 12

Candidate Starts for OhMyWard\_30:

(Start: 12 @22858 has 44 MA's), (30, 22999), (46, 23146), (51, 23173), (54, 23188), (60, 23272), (71, 23377), (72, 23380), (79, 23455), (85, 23485),

Gene: OlgasClover\_30 Start: 23043, Stop: 23831, Start Num: 12

Candidate Starts for OlgasClover\_30:

(Start: 12 @23043 has 44 MA's), (16, 23088), (20, 23118), (23, 23130), (30, 23184), (45, 23328), (46, 23331), (51, 23358), (54, 23373), (60, 23457), (71, 23562), (72, 23565), (79, 23640),

Gene: Pepy6\_033 Start: 28827, Stop: 29618, Start Num: 12

Candidate Starts for Pepy6\_033:

(9, 28815), (Start: 12 @28827 has 44 MA's), (30, 28968), (43, 29103), (45, 29118), (55, 29166), (64, 29277), (70, 29343), (72, 29355), (77, 29412), (87, 29511), (90, 29565),

Gene: Perkunas\_29 Start: 19840, Stop: 20625, Start Num: 12

Candidate Starts for Perkunas\_29:

(Start: 12 @19840 has 44 MA's), (15, 19855), (24, 19933), (30, 19981), (31, 19987), (45, 20125), (54, 20170), (71, 20359), (72, 20362), (79, 20437), (84, 20464),

Gene: Petite\_29 Start: 20607, Stop: 21392, Start Num: 12

Candidate Starts for Petite\_29:



(Start: 12 @20607 has 44 MA's), (16, 20652), (28, 20730), (30, 20748), (31, 20754), (32, 20757), (45, 20892), (52, 20925), (54, 20937), (71, 21126), (72, 21129), (79, 21204), (84, 21231), (91, 21351),

Gene: Phepper\_30 Start: 22090, Stop: 22878, Start Num: 12

Candidate Starts for Phepper\_30:

(Start: 12 @22090 has 44 MA's), (20, 22165), (23, 22177), (30, 22231), (31, 22237), (36, 22282), (38, 22312), (46, 22378), (50, 22396), (52, 22408), (53, 22414), (54, 22420), (71, 22609), (72, 22612), (79, 22687), (91, 22834),

Gene: Pherobrine\_29 Start: 22125, Stop: 22910, Start Num: 12

Candidate Starts for Pherobrine\_29:

(7, 22080), (Start: 12 @22125 has 44 MA's), (16, 22170), (30, 22266), (46, 22413), (50, 22431), (51, 22440), (54, 22455), (60, 22539), (66, 22587), (72, 22647), (79, 22722),

Gene: Poco6\_034 Start: 30846, Stop: 31637, Start Num: 12

Candidate Starts for Poco6\_034:

(Start: 12 @30846 has 44 MA's), (30, 30987), (36, 31038), (45, 31137), (55, 31185), (64, 31296), (72, 31374), (77, 31431), (85, 31479), (90, 31584),

Gene: Rickmore\_29 Start: 20743, Stop: 21531, Start Num: 12

Candidate Starts for Rickmore\_29:

(Start: 12 @20743 has 44 MA's), (29, 20869), (30, 20884), (46, 21031), (54, 21073), (65, 21193), (72, 21265), (91, 21487),

Gene: Roney\_27 Start: 19428, Stop: 20213, Start Num: 12

Candidate Starts for Roney\_27:

(Start: 12 @19428 has 44 MA's), (15, 19443), (17, 19491), (25, 19524), (30, 19569), (31, 19575), (45, 19713), (52, 19746), (54, 19758), (71, 19947), (72, 19950), (79, 20025), (84, 20052), (91, 20172),

Gene: Runhaar\_30 Start: 22093, Stop: 22881, Start Num: 12

Candidate Starts for Runhaar\_30:

(Start: 12 @22093 has 44 MA's), (20, 22168), (23, 22180), (30, 22234), (31, 22240), (36, 22285), (38, 22315), (46, 22381), (50, 22399), (52, 22411), (53, 22417), (54, 22423), (71, 22612), (72, 22615), (74, 22630), (79, 22690), (91, 22837),

Gene: Sapo\_40 Start: 36566, Stop: 37357, Start Num: 10

Candidate Starts for Sapo\_40:

(5, 36521), (6, 36524), (Start: 10 @36566 has 3 MA's), (14, 36584), (20, 36641), (22, 36650), (37, 36785), (43, 36845), (51, 36893), (52, 36896), (58, 36989), (67, 37046), (73, 37109), (92, 37331),

Gene: Schwartz33\_31 Start: 22450, Stop: 23235, Start Num: 12

Candidate Starts for Schwartz33\_31:

(4, 22369), (Start: 12 @22450 has 44 MA's), (23, 22537), (30, 22591), (43, 22720), (50, 22756), (51, 22765), (52, 22768), (54, 22780), (66, 22912), (71, 22969), (72, 22972), (88, 23137),

Gene: Secretariat\_28 Start: 21176, Stop: 21964, Start Num: 12

Candidate Starts for Secretariat\_28:

(Start: 12 @21176 has 44 MA's), (23, 21263), (30, 21317), (40, 21419), (41, 21422), (45, 21461), (50, 21482), (51, 21491), (54, 21506), (66, 21638), (71, 21695), (72, 21698), (84, 21800), (88, 21863),

Gene: ShaggyRogers\_33 Start: 22096, Stop: 22884, Start Num: 12

Candidate Starts for ShaggyRogers\_33:

(Start: 12 @22096 has 44 MA's), (16, 22141), (23, 22183), (29, 22222), (30, 22237), (54, 22426), (65, 22546), (71, 22615), (72, 22618), (79, 22693), (91, 22840),

Gene: Tanis\_27 Start: 19278, Stop: 20063, Start Num: 12

Candidate Starts for Tanis\_27:

(Start: 12 @19278 has 44 MA's), (15, 19293), (17, 19341), (25, 19374), (30, 19419), (31, 19425), (45, 19563), (52, 19596), (54, 19608), (71, 19797), (72, 19800), (79, 19875), (84, 19902), (91, 20022),

Gene: TenaciousP\_31 Start: 23744, Stop: 24532, Start Num: 12

Candidate Starts for TenaciousP\_31:

(Start: 12 @23744 has 44 MA's), (16, 23789), (20, 23819), (23, 23831), (30, 23885), (46, 24032), (54, 24074), (60, 24158), (71, 24263), (72, 24266), (79, 24341), (91, 24488),

Gene: Untouchable\_30 Start: 22449, Stop: 23237, Start Num: 12

Candidate Starts for Untouchable\_30:

(Start: 12 @22449 has 44 MA's), (16, 22494), (20, 22524), (23, 22536), (30, 22590), (31, 22596), (36, 22641), (46, 22737), (50, 22755), (51, 22764), (54, 22779), (71, 22968), (72, 22971), (74, 22986), (79, 23046), (84, 23073), (91, 23193),

Gene: Vardy\_30 Start: 22058, Stop: 22846, Start Num: 12

Candidate Starts for Vardy\_30:

(Start: 12 @22058 has 44 MA's), (20, 22133), (23, 22145), (30, 22199), (31, 22205), (36, 22250), (38, 22280), (46, 22346), (50, 22364), (52, 22376), (53, 22382), (54, 22388), (71, 22577), (72, 22580), (74, 22595), (79, 22655), (91, 22802),

Gene: Zeph\_31 Start: 22807, Stop: 23595, Start Num: 12

Candidate Starts for Zeph\_31:

(Start: 12 @22807 has 44 MA's), (20, 22882), (23, 22894), (30, 22948), (31, 22954), (36, 22999), (46, 23095), (50, 23113), (51, 23122), (53, 23131), (54, 23137), (71, 23326), (72, 23329), (74, 23344), (79, 23404), (91, 23551),