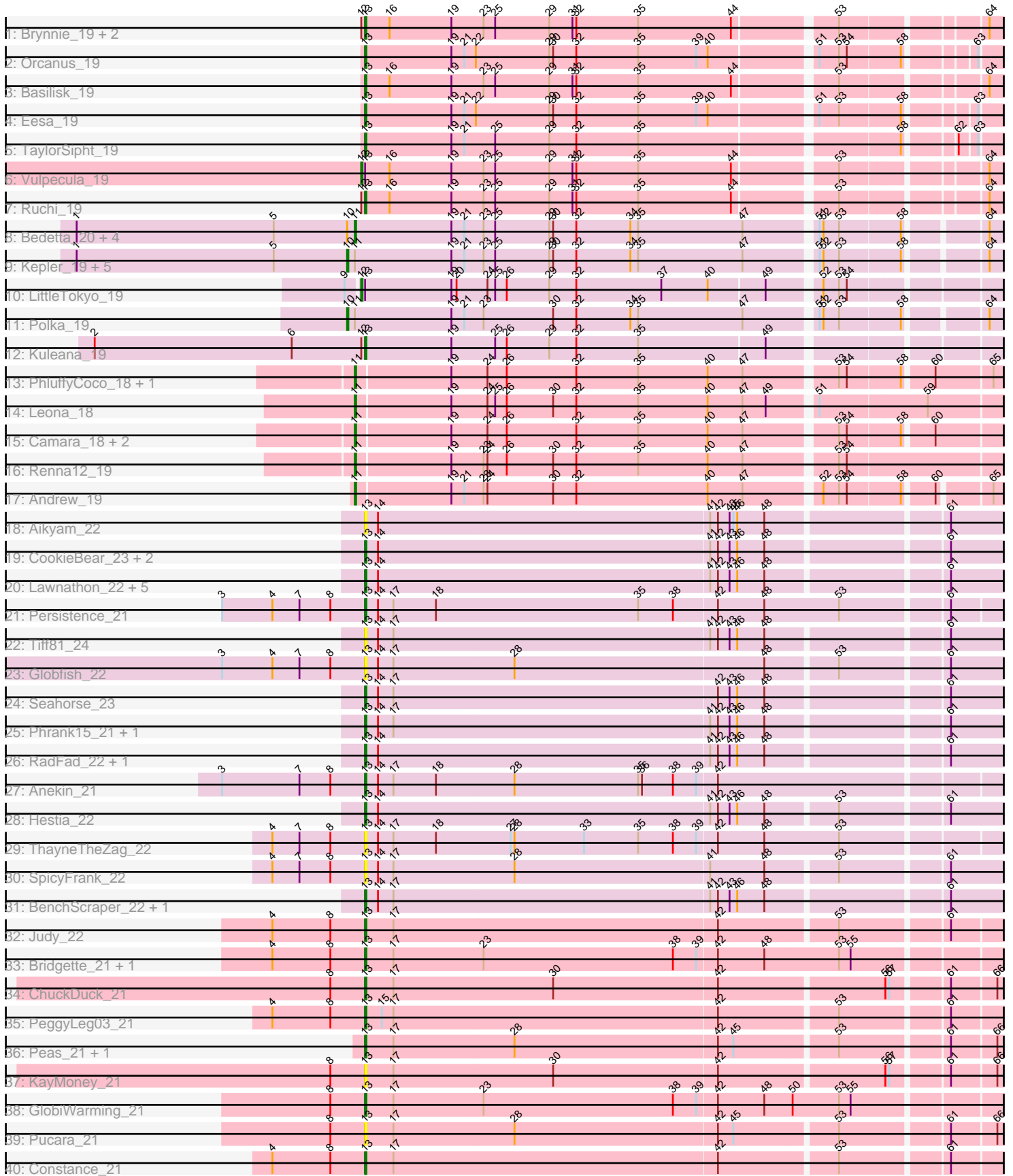


# Zoomed Pham 195574



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 195574 Report

This analysis was run 12/09/24 on database version 580.

Pham number 195574 has 66 members, 16 are drafts.

Phages represented in each track:

- Track 1 : Brynnie\_19, Jamun\_19, Chickaboom\_18
- Track 2 : Orcanus\_19
- Track 3 : Basilisk\_19
- Track 4 : Eesa\_19
- Track 5 : TaylorSipht\_19
- Track 6 : Vulpecula\_19
- Track 7 : Ruchi\_19
- Track 8 : Bedetta\_20, Colusalem\_19, Lunar\_20, Jerole\_20, Amelia\_20
- Track 9 : Kepler\_19, Daob\_20, Coral\_19, Melons\_20, HannahPhantana\_20, Cote\_20
- Track 10 : LittleTokyo\_19
- Track 11 : Polka\_19
- Track 12 : Kuleana\_19
- Track 13 : PhluffyCoco\_18, RedFox\_18
- Track 14 : Leona\_18
- Track 15 : Camara\_18, KHumphrey\_18, Juno112\_18
- Track 16 : Renna12\_19
- Track 17 : Andrew\_19
- Track 18 : Aikyam\_22
- Track 19 : CookieBear\_23, MidnightRain\_22, YoungHarleezy\_22
- Track 20 : Lawnathon\_22, Raphaella\_22, Auxilium\_22, Gorpy\_22, BillyTP\_22, Sakai\_22
- Track 21 : Persistence\_21
- Track 22 : Tiff81\_24
- Track 23 : Globfish\_22
- Track 24 : Seahorse\_23
- Track 25 : Phrank15\_21, Isolde\_22
- Track 26 : RadFad\_22, Hillester\_22
- Track 27 : Anekin\_21
- Track 28 : Hestia\_22
- Track 29 : ThayneTheZag\_22
- Track 30 : SpicyFrank\_22
- Track 31 : BenchScraper\_22, Richie\_22
- Track 32 : Judy\_22
- Track 33 : Bridgette\_21, Karkharias\_21
- Track 34 : ChuckDuck\_21
- Track 35 : PeggyLeg03\_21

- Track 36 : Peas\_21, Eileen\_21
- Track 37 : KayMoney\_21
- Track 38 : GlobiWarming\_21
- Track 39 : Pucara\_21
- Track 40 : Constance\_21

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

The start number called the most often in the published annotations is 13, it was called in 33 of the 50 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aikyam\_22, Anekin\_21, Auxilium\_22, Basilisk\_19, BenchScraper\_22, BillyTP\_22, Bridgette\_21, Brynnie\_19, Chickaboom\_18, ChuckDuck\_21, Constance\_21, CookieBear\_23, Eesa\_19, Eileen\_21, Globfish\_22, GlobiWarming\_21, Gorpy\_22, Hestia\_22, Hillester\_22, Isolde\_22, Jamun\_19, Judy\_22, Karkharias\_21, KayMoney\_21, Kuleana\_19, Lawnathon\_22, MidnightRain\_22, Orcanus\_19, Peas\_21, PeggyLeg03\_21, Persistence\_21, Phrank15\_21, Pucara\_21, RadFad\_22, Raphaella\_22, Richie\_22, Ruchi\_19, Sakai\_22, Seahorse\_23, SpicyFrank\_22, TaylorSipht\_19, ThayneTheZag\_22, Tiff81\_24, YoungHarleezy\_22,

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

- LittleTokyo\_19, Vulpecula\_19,

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

- Amelia\_20, Andrew\_19, Bedetta\_20, Camara\_18, Colusalem\_19, Coral\_19, Cote\_20, Daob\_20, HannahPhantana\_20, Jerole\_20, Juno112\_18, KHumphrey\_18, Kepler\_19, Leona\_18, Lunar\_20, Melons\_20, PhluffyCoco\_18, Polka\_19, RedFox\_18, Renna12\_19,

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

Start 10:

- Found in 12 of 66 ( 18.2% ) of genes in pham
- Manual Annotations of this start: 7 of 50
- Called 58.3% of time when present
- Phage (with cluster) where this start called: Coral\_19 (AS2), Cote\_20 (AS2), Daob\_20 (AS2), HannahPhantana\_20 (AS2), Kepler\_19 (AS2), Melons\_20 (AS2), Polka\_19 (AS2),

Start 11:

- Found in 20 of 66 ( 30.3% ) of genes in pham
- Manual Annotations of this start: 8 of 50
- Called 65.0% of time when present
- Phage (with cluster) where this start called: Amelia\_20 (AS2), Andrew\_19 (AS3), Bedetta\_20 (AS2), Camara\_18 (AS3), Colusalem\_19 (AS2), Jerole\_20 (AS2), Juno112\_18 (AS3), KHumphrey\_18 (AS3), Leona\_18 (AS3), Lunar\_20 (AS2), PhluffyCoco\_18 (AS3), RedFox\_18 (AS3), Renna12\_19 (AS3),

Start 12:

- Found in 7 of 66 ( 10.6% ) of genes in pham
- Manual Annotations of this start: 2 of 50
- Called 28.6% of time when present
- Phage (with cluster) where this start called: LittleTokyo\_19 (AS2), Vulpecula\_19 (AS1),

Start 13:

- Found in 46 of 66 ( 69.7% ) of genes in pham
- Manual Annotations of this start: 33 of 50
- Called 95.7% of time when present
- Phage (with cluster) where this start called: Aikyam\_22 (AY), Anekin\_21 (AY), Auxilium\_22 (AY), Basilisk\_19 (AS1), BenchScraper\_22 (AY), BillyTP\_22 (AY), Bridgette\_21 (FA), Brynnie\_19 (AS1), Chickaboom\_18 (AS1), ChuckDuck\_21 (FA), Constance\_21 (FA), CookieBear\_23 (AY), Eesa\_19 (AS1), Eileen\_21 (FA), Globfish\_22 (AY), GlobiWarming\_21 (FA), Gorpy\_22 (AY), Hestia\_22 (AY), Hillester\_22 (AY), Isolde\_22 (AY), Jamun\_19 (AS1), Judy\_22 (FA), Karkharias\_21 (FA), KayMoney\_21 (FA), Kuleana\_19 (AS2), Lawnathon\_22 (AY), MidnightRain\_22 (AY), Orcanus\_19 (AS1), Peas\_21 (FA), PeggyLeg03\_21 (FA), Persistence\_21 (AY), Phrank15\_21 (AY), Pucara\_21 (FA), RadFad\_22 (AY), Raphaella\_22 (AY), Richie\_22 (AY), Ruchi\_19 (AS1), Sakai\_22 (AY), Seahorse\_23 (AY), SpicyFrank\_22 (AY), TaylorSipht\_19 (AS1), ThayneTheZag\_22 (AY), Tiff81\_24 (AY), YoungHarleezy\_22 (AY),

### **Summary by clusters:**

There are 5 clusters represented in this pham: AY, AS3, AS1, FA, AS2,

Info for manual annotations of cluster AS1:

- Start number 12 was manually annotated 1 time for cluster AS1.
- Start number 13 was manually annotated 8 times for cluster AS1.

Info for manual annotations of cluster AS2:

- Start number 10 was manually annotated 7 times for cluster AS2.
- Start number 11 was manually annotated 2 times for cluster AS2.
- Start number 12 was manually annotated 1 time for cluster AS2.
- Start number 13 was manually annotated 1 time for cluster AS2.

Info for manual annotations of cluster AS3:

- Start number 11 was manually annotated 6 times for cluster AS3.

Info for manual annotations of cluster AY:

- Start number 13 was manually annotated 15 times for cluster AY.

Info for manual annotations of cluster FA:

- Start number 13 was manually annotated 9 times for cluster FA.

### **Gene Information:**

Gene: Aikyam\_22 Start: 16934, Stop: 17893, Start Num: 13

Candidate Starts for Aikyam\_22:

(Start: 13 @16934 has 33 MA's), (14, 16943), (41, 17198), (42, 17204), (43, 17213), (45, 17216), (46, 17219), (48, 17240), (61, 17369), (73, 17609), (78, 17696), (88, 17783), (97, 17876),

Gene: Amelia\_20 Start: 14633, Stop: 15586, Start Num: 11

Candidate Starts for Amelia\_20:

(1, 14417), (5, 14570), (Start: 10 @14627 has 7 MA's), (Start: 11 @14633 has 8 MA's), (19, 14708), (21, 14717), (23, 14732), (25, 14741), (29, 14783), (30, 14786), (32, 14804), (34, 14846), (35, 14852), (47, 14933), (51, 14984), (52, 14987), (53, 14999), (58, 15044), (64, 15098), (69, 15146), (70, 15194), (72, 15260), (78, 15389), (80, 15401), (83, 15416), (84, 15419), (91, 15503), (92, 15527), (93, 15530), (96, 15563),

Gene: Andrew\_19 Start: 14644, Stop: 15597, Start Num: 11

Candidate Starts for Andrew\_19:

(Start: 11 @14644 has 8 MA's), (19, 14716), (21, 14725), (23, 14740), (24, 14743), (30, 14794), (32, 14812), (40, 14914), (47, 14941), (52, 14995), (53, 15007), (54, 15013), (58, 15052), (60, 15073), (65, 15109), (71, 15232), (74, 15328), (77, 15352), (78, 15400), (80, 15412), (83, 15427), (86, 15472), (91, 15514), (92, 15538),

Gene: Anekin\_21 Start: 16896, Stop: 17858, Start Num: 13

Candidate Starts for Anekin\_21:

(3, 16785), (7, 16845), (8, 16869), (Start: 13 @16896 has 33 MA's), (14, 16905), (17, 16917), (18, 16950), (28, 17010), (35, 17106), (36, 17109), (38, 17133), (39, 17151), (42, 17166), (80, 17673), (88, 17748), (89, 17751), (97, 17841),

Gene: Auxilium\_22 Start: 16933, Stop: 17892, Start Num: 13

Candidate Starts for Auxilium\_22:

(Start: 13 @16933 has 33 MA's), (14, 16942), (41, 17197), (42, 17203), (43, 17212), (46, 17218), (48, 17239), (61, 17368), (73, 17608), (78, 17695), (88, 17782), (97, 17875),

Gene: Basilisk\_19 Start: 15922, Stop: 16863, Start Num: 13

Candidate Starts for Basilisk\_19:

(Start: 13 @15922 has 33 MA's), (16, 15940), (19, 15988), (23, 16012), (25, 16021), (29, 16063), (31, 16081), (32, 16084), (35, 16132), (44, 16204), (53, 16276), (64, 16375), (83, 16693), (86, 16738), (92, 16804),

Gene: Bedetta\_20 Start: 14633, Stop: 15586, Start Num: 11

Candidate Starts for Bedetta\_20:

(1, 14417), (5, 14570), (Start: 10 @14627 has 7 MA's), (Start: 11 @14633 has 8 MA's), (19, 14708), (21, 14717), (23, 14732), (25, 14741), (29, 14783), (30, 14786), (32, 14804), (34, 14846), (35, 14852), (47, 14933), (51, 14984), (52, 14987), (53, 14999), (58, 15044), (64, 15098), (69, 15146), (70, 15194), (72, 15260), (78, 15389), (80, 15401), (83, 15416), (84, 15419), (91, 15503), (92, 15527), (93, 15530), (96, 15563),

Gene: BenchScraper\_22 Start: 16948, Stop: 17907, Start Num: 13

Candidate Starts for BenchScraper\_22:

(Start: 13 @16948 has 33 MA's), (14, 16957), (17, 16969), (41, 17212), (42, 17218), (43, 17227), (46, 17233), (48, 17254), (61, 17383), (73, 17623), (78, 17710), (85, 17743), (88, 17797), (97, 17890),

Gene: BillyTP\_22 Start: 16717, Stop: 17676, Start Num: 13

Candidate Starts for BillyTP\_22:

(Start: 13 @16717 has 33 MA's), (14, 16726), (41, 16981), (42, 16987), (43, 16996), (46, 17002), (48, 17023), (61, 17152), (73, 17392), (78, 17479), (88, 17566), (97, 17659),

Gene: Bridgette\_21 Start: 16995, Stop: 17957, Start Num: 13

Candidate Starts for Bridgette\_21:

(4, 16923), (8, 16968), (Start: 13 @16995 has 33 MA's), (17, 17016), (23, 17085), (38, 17232), (39, 17250), (42, 17265), (48, 17301), (53, 17358), (55, 17367), (67, 17478), (73, 17673), (78, 17760), (97, 17940),

Gene: Brynnie\_19 Start: 15734, Stop: 16675, Start Num: 13

Candidate Starts for Brynnie\_19:

(Start: 12 @15731 has 2 MA's), (Start: 13 @15734 has 33 MA's), (16, 15752), (19, 15800), (23, 15824), (25, 15833), (29, 15875), (31, 15893), (32, 15896), (35, 15944), (44, 16016), (53, 16088), (64, 16187), (83, 16505), (86, 16550), (92, 16616),

Gene: Camara\_18 Start: 14181, Stop: 15140, Start Num: 11

Candidate Starts for Camara\_18:

(Start: 11 @14181 has 8 MA's), (19, 14253), (24, 14280), (26, 14295), (32, 14349), (35, 14397), (40, 14451), (47, 14478), (53, 14544), (54, 14550), (58, 14589), (60, 14610), (78, 14943), (79, 14952), (80, 14955), (83, 14970), (89, 15033), (92, 15081),

Gene: Chickaboom\_18 Start: 14660, Stop: 15601, Start Num: 13

Candidate Starts for Chickaboom\_18:

(Start: 12 @14657 has 2 MA's), (Start: 13 @14660 has 33 MA's), (16, 14678), (19, 14726), (23, 14750), (25, 14759), (29, 14801), (31, 14819), (32, 14822), (35, 14870), (44, 14942), (53, 15014), (64, 15113), (83, 15431), (86, 15476), (92, 15542),

Gene: ChuckDuck\_21 Start: 16837, Stop: 17793, Start Num: 13

Candidate Starts for ChuckDuck\_21:

(8, 16810), (Start: 13 @16837 has 33 MA's), (17, 16858), (30, 16981), (42, 17107), (56, 17230), (57, 17233), (61, 17272), (66, 17305), (67, 17314), (73, 17509), (88, 17683), (97, 17776),

Gene: Colusalem\_19 Start: 14472, Stop: 15425, Start Num: 11

Candidate Starts for Colusalem\_19:

(1, 14256), (5, 14409), (Start: 10 @14466 has 7 MA's), (Start: 11 @14472 has 8 MA's), (19, 14547), (21, 14556), (23, 14571), (25, 14580), (29, 14622), (30, 14625), (32, 14643), (34, 14685), (35, 14691), (47, 14772), (51, 14823), (52, 14826), (53, 14838), (58, 14883), (64, 14937), (69, 14985), (70, 15033), (72, 15099), (78, 15228), (80, 15240), (83, 15255), (84, 15258), (91, 15342), (92, 15366), (93, 15369), (96, 15402),

Gene: Constance\_21 Start: 16977, Stop: 17933, Start Num: 13

Candidate Starts for Constance\_21:

(4, 16905), (8, 16950), (Start: 13 @16977 has 33 MA's), (17, 16998), (42, 17247), (53, 17334), (61, 17412), (67, 17454), (73, 17649), (78, 17736), (88, 17823), (97, 17916),

Gene: CookieBear\_23 Start: 16933, Stop: 17892, Start Num: 13

Candidate Starts for CookieBear\_23:

(Start: 13 @16933 has 33 MA's), (14, 16942), (41, 17197), (42, 17203), (43, 17212), (46, 17218), (48, 17239), (61, 17368), (73, 17608), (77, 17650), (78, 17695), (88, 17782), (97, 17875),

Gene: Coral\_19 Start: 14466, Stop: 15425, Start Num: 10

Candidate Starts for Coral\_19:

(1, 14256), (5, 14409), (Start: 10 @14466 has 7 MA's), (Start: 11 @14472 has 8 MA's), (19, 14547), (21, 14556), (23, 14571), (25, 14580), (29, 14622), (30, 14625), (32, 14643), (34, 14685), (35, 14691), (47, 14772), (51, 14823), (52, 14826), (53, 14838), (58, 14883), (64, 14937), (69, 14985), (70, 15033), (72, 15099), (78, 15228), (80, 15240), (83, 15255), (84, 15258), (91, 15342), (92, 15366), (93, 15369),

(96, 15402),

Gene: Cote\_20 Start: 14627, Stop: 15586, Start Num: 10

Candidate Starts for Cote\_20:

(1, 14417), (5, 14570), (Start: 10 @14627 has 7 MA's), (Start: 11 @14633 has 8 MA's), (19, 14708), (21, 14717), (23, 14732), (25, 14741), (29, 14783), (30, 14786), (32, 14804), (34, 14846), (35, 14852), (47, 14933), (51, 14984), (52, 14987), (53, 14999), (58, 15044), (64, 15098), (69, 15146), (70, 15194), (72, 15260), (78, 15389), (80, 15401), (83, 15416), (84, 15419), (91, 15503), (92, 15527), (93, 15530), (96, 15563),

Gene: Daob\_20 Start: 14630, Stop: 15589, Start Num: 10

Candidate Starts for Daob\_20:

(1, 14420), (5, 14573), (Start: 10 @14630 has 7 MA's), (Start: 11 @14636 has 8 MA's), (19, 14711), (21, 14720), (23, 14735), (25, 14744), (29, 14786), (30, 14789), (32, 14807), (34, 14849), (35, 14855), (47, 14936), (51, 14987), (52, 14990), (53, 15002), (58, 15047), (64, 15101), (69, 15149), (70, 15197), (72, 15263), (78, 15392), (80, 15404), (83, 15419), (84, 15422), (91, 15506), (92, 15530), (93, 15533), (96, 15566),

Gene: Eesa\_19 Start: 15885, Stop: 16823, Start Num: 13

Candidate Starts for Eesa\_19:

(Start: 13 @15885 has 33 MA's), (19, 15951), (21, 15960), (22, 15969), (29, 16026), (30, 16029), (32, 16047), (35, 16095), (39, 16140), (40, 16149), (51, 16224), (53, 16239), (58, 16284), (63, 16329), (77, 16578), (83, 16653), (86, 16698), (92, 16764), (94, 16776), (96, 16800),

Gene: Eileen\_21 Start: 16939, Stop: 17895, Start Num: 13

Candidate Starts for Eileen\_21:

(Start: 13 @16939 has 33 MA's), (17, 16960), (28, 17053), (42, 17209), (45, 17221), (53, 17296), (61, 17374), (66, 17407), (67, 17416), (73, 17611), (78, 17698), (97, 17878),

Gene: Globfish\_22 Start: 17006, Stop: 17965, Start Num: 13

Candidate Starts for Globfish\_22:

(3, 16895), (4, 16934), (7, 16955), (8, 16979), (Start: 13 @17006 has 33 MA's), (14, 17015), (17, 17027), (28, 17120), (48, 17312), (53, 17363), (61, 17441), (73, 17681), (77, 17723), (78, 17768), (80, 17780), (88, 17855), (97, 17948),

Gene: GlobiWarming\_21 Start: 16931, Stop: 17893, Start Num: 13

Candidate Starts for GlobiWarming\_21:

(8, 16904), (Start: 13 @16931 has 33 MA's), (17, 16952), (23, 17021), (38, 17168), (39, 17186), (42, 17201), (48, 17237), (50, 17258), (53, 17294), (55, 17303), (67, 17414), (73, 17609), (78, 17696), (97, 17876),

Gene: Gorpy\_22 Start: 16942, Stop: 17901, Start Num: 13

Candidate Starts for Gorpy\_22:

(Start: 13 @16942 has 33 MA's), (14, 16951), (41, 17206), (42, 17212), (43, 17221), (46, 17227), (48, 17248), (61, 17377), (73, 17617), (78, 17704), (88, 17791), (97, 17884),

Gene: HannahPhantana\_20 Start: 14630, Stop: 15589, Start Num: 10

Candidate Starts for HannahPhantana\_20:

(1, 14420), (5, 14573), (Start: 10 @14630 has 7 MA's), (Start: 11 @14636 has 8 MA's), (19, 14711), (21, 14720), (23, 14735), (25, 14744), (29, 14786), (30, 14789), (32, 14807), (34, 14849), (35, 14855), (47, 14936), (51, 14987), (52, 14990), (53, 15002), (58, 15047), (64, 15101), (69, 15149), (70, 15197), (72, 15263), (78, 15392), (80, 15404), (83, 15419), (84, 15422), (91, 15506), (92, 15530), (93, 15533), (96, 15566),

Gene: Hestia\_22 Start: 17111, Stop: 18070, Start Num: 13

Candidate Starts for Hestia\_22:

(Start: 13 @17111 has 33 MA's), (14, 17120), (41, 17375), (42, 17381), (43, 17390), (46, 17396), (48, 17417), (53, 17468), (61, 17546), (73, 17786), (78, 17873), (88, 17960), (97, 18053),

Gene: Hillester\_22 Start: 16933, Stop: 17892, Start Num: 13

Candidate Starts for Hillester\_22:

(Start: 13 @16933 has 33 MA's), (14, 16942), (41, 17197), (42, 17203), (43, 17212), (46, 17218), (48, 17239), (61, 17368), (73, 17608), (78, 17695), (80, 17707), (88, 17782), (90, 17788), (97, 17875),

Gene: Isolde\_22 Start: 16768, Stop: 17727, Start Num: 13

Candidate Starts for Isolde\_22:

(Start: 13 @16768 has 33 MA's), (14, 16777), (17, 16789), (41, 17032), (42, 17038), (43, 17047), (46, 17053), (48, 17074), (61, 17203), (73, 17443), (77, 17485), (78, 17530), (88, 17617), (97, 17710),

Gene: Jamun\_19 Start: 15328, Stop: 16269, Start Num: 13

Candidate Starts for Jamun\_19:

(Start: 12 @15325 has 2 MA's), (Start: 13 @15328 has 33 MA's), (16, 15346), (19, 15394), (23, 15418), (25, 15427), (29, 15469), (31, 15487), (32, 15490), (35, 15538), (44, 15610), (53, 15682), (64, 15781), (83, 16099), (86, 16144), (92, 16210),

Gene: Jerole\_20 Start: 14633, Stop: 15586, Start Num: 11

Candidate Starts for Jerole\_20:

(1, 14417), (5, 14570), (Start: 10 @14627 has 7 MA's), (Start: 11 @14633 has 8 MA's), (19, 14708), (21, 14717), (23, 14732), (25, 14741), (29, 14783), (30, 14786), (32, 14804), (34, 14846), (35, 14852), (47, 14933), (51, 14984), (52, 14987), (53, 14999), (58, 15044), (64, 15098), (69, 15146), (70, 15194), (72, 15260), (78, 15389), (80, 15401), (83, 15416), (84, 15419), (91, 15503), (92, 15527), (93, 15530), (96, 15563),

Gene: Judy\_22 Start: 17248, Stop: 18204, Start Num: 13

Candidate Starts for Judy\_22:

(4, 17176), (8, 17221), (Start: 13 @17248 has 33 MA's), (17, 17269), (42, 17518), (53, 17605), (61, 17683), (67, 17725), (73, 17920), (75, 17944), (78, 18007), (97, 18187),

Gene: Juno112\_18 Start: 14181, Stop: 15140, Start Num: 11

Candidate Starts for Juno112\_18:

(Start: 11 @14181 has 8 MA's), (19, 14253), (24, 14280), (26, 14295), (32, 14349), (35, 14397), (40, 14451), (47, 14478), (53, 14544), (54, 14550), (58, 14589), (60, 14610), (78, 14943), (79, 14952), (80, 14955), (83, 14970), (89, 15033), (92, 15081),

Gene: KHumphrey\_18 Start: 14178, Stop: 15137, Start Num: 11

Candidate Starts for KHumphrey\_18:

(Start: 11 @14178 has 8 MA's), (19, 14250), (24, 14277), (26, 14292), (32, 14346), (35, 14394), (40, 14448), (47, 14475), (53, 14541), (54, 14547), (58, 14586), (60, 14607), (78, 14940), (79, 14949), (80, 14952), (83, 14967), (89, 15030), (92, 15078),

Gene: Karkharias\_21 Start: 16935, Stop: 17897, Start Num: 13

Candidate Starts for Karkharias\_21:

(4, 16863), (8, 16908), (Start: 13 @16935 has 33 MA's), (17, 16956), (23, 17025), (38, 17172), (39, 17190), (42, 17205), (48, 17241), (53, 17298), (55, 17307), (67, 17418), (73, 17613), (78, 17700), (97, 17880),



Gene: KayMoney\_21 Start: 16839, Stop: 17795, Start Num: 13

Candidate Starts for KayMoney\_21:

(8, 16812), (Start: 13 @16839 has 33 MA's), (17, 16860), (30, 16983), (42, 17109), (56, 17232), (57, 17235), (61, 17274), (66, 17307), (67, 17316), (73, 17511), (78, 17598), (88, 17685), (97, 17778),

Gene: Kepler\_19 Start: 14465, Stop: 15424, Start Num: 10

Candidate Starts for Kepler\_19:

(1, 14255), (5, 14408), (Start: 10 @14465 has 7 MA's), (Start: 11 @14471 has 8 MA's), (19, 14546), (21, 14555), (23, 14570), (25, 14579), (29, 14621), (30, 14624), (32, 14642), (34, 14684), (35, 14690), (47, 14771), (51, 14822), (52, 14825), (53, 14837), (58, 14882), (64, 14936), (69, 14984), (70, 15032), (72, 15098), (78, 15227), (80, 15239), (83, 15254), (84, 15257), (91, 15341), (92, 15365), (93, 15368), (96, 15401),

Gene: Kuleana\_19 Start: 14642, Stop: 15589, Start Num: 13

Candidate Starts for Kuleana\_19:

(2, 14432), (6, 14585), (Start: 12 @14639 has 2 MA's), (Start: 13 @14642 has 33 MA's), (19, 14708), (25, 14741), (26, 14750), (29, 14783), (32, 14804), (35, 14852), (49, 14948), (68, 15116), (70, 15194), (76, 15338), (78, 15389), (81, 15407), (92, 15527), (95, 15548), (96, 15563),

Gene: Lawnathon\_22 Start: 16862, Stop: 17821, Start Num: 13

Candidate Starts for Lawnathon\_22:

(Start: 13 @16862 has 33 MA's), (14, 16871), (41, 17126), (42, 17132), (43, 17141), (46, 17147), (48, 17168), (61, 17297), (73, 17537), (78, 17624), (88, 17711), (97, 17804),

Gene: Leona\_18 Start: 14234, Stop: 15199, Start Num: 11

Candidate Starts for Leona\_18:

(Start: 11 @14234 has 8 MA's), (19, 14306), (24, 14333), (25, 14339), (26, 14348), (30, 14384), (32, 14402), (35, 14450), (40, 14504), (47, 14531), (49, 14549), (51, 14582), (59, 14663), (78, 15002), (79, 15011), (80, 15014), (83, 15029), (92, 15140),

Gene: LittleTokyo\_19 Start: 14585, Stop: 15535, Start Num: 12

Candidate Starts for LittleTokyo\_19:

(9, 14576), (Start: 12 @14585 has 2 MA's), (Start: 13 @14588 has 33 MA's), (19, 14654), (20, 14657), (24, 14681), (25, 14687), (26, 14696), (29, 14729), (32, 14750), (37, 14816), (40, 14852), (49, 14894), (52, 14930), (53, 14942), (54, 14948), (68, 15062), (71, 15170), (76, 15284), (78, 15335), (81, 15353), (92, 15473), (94, 15485), (95, 15494), (96, 15509),

Gene: Lunar\_20 Start: 14633, Stop: 15586, Start Num: 11

Candidate Starts for Lunar\_20:

(1, 14417), (5, 14570), (Start: 10 @14627 has 7 MA's), (Start: 11 @14633 has 8 MA's), (19, 14708), (21, 14717), (23, 14732), (25, 14741), (29, 14783), (30, 14786), (32, 14804), (34, 14846), (35, 14852), (47, 14933), (51, 14984), (52, 14987), (53, 14999), (58, 15044), (64, 15098), (69, 15146), (70, 15194), (72, 15260), (78, 15389), (80, 15401), (83, 15416), (84, 15419), (91, 15503), (92, 15527), (93, 15530), (96, 15563),

Gene: Melons\_20 Start: 14627, Stop: 15586, Start Num: 10

Candidate Starts for Melons\_20:

(1, 14417), (5, 14570), (Start: 10 @14627 has 7 MA's), (Start: 11 @14633 has 8 MA's), (19, 14708), (21, 14717), (23, 14732), (25, 14741), (29, 14783), (30, 14786), (32, 14804), (34, 14846), (35, 14852), (47, 14933), (51, 14984), (52, 14987), (53, 14999), (58, 15044), (64, 15098), (69, 15146), (70, 15194), (72, 15260), (78, 15389), (80, 15401), (83, 15416), (84, 15419), (91, 15503), (92, 15527), (93, 15530), (96, 15563),

Gene: MidnightRain\_22 Start: 16932, Stop: 17891, Start Num: 13

Candidate Starts for MidnightRain\_22:

(Start: 13 @16932 has 33 MA's), (14, 16941), (41, 17196), (42, 17202), (43, 17211), (46, 17217), (48, 17238), (61, 17367), (73, 17607), (77, 17649), (78, 17694), (88, 17781), (97, 17874),

Gene: Orcanus\_19 Start: 15585, Stop: 16523, Start Num: 13

Candidate Starts for Orcanus\_19:

(Start: 13 @15585 has 33 MA's), (19, 15651), (21, 15660), (22, 15669), (29, 15726), (30, 15729), (32, 15747), (35, 15795), (39, 15840), (40, 15849), (51, 15924), (53, 15939), (54, 15945), (58, 15984), (63, 16029), (77, 16278), (83, 16353), (86, 16398), (92, 16464), (94, 16476), (96, 16500),

Gene: Peas\_21 Start: 16939, Stop: 17895, Start Num: 13

Candidate Starts for Peas\_21:

(Start: 13 @16939 has 33 MA's), (17, 16960), (28, 17053), (42, 17209), (45, 17221), (53, 17296), (61, 17374), (66, 17407), (67, 17416), (73, 17611), (78, 17698), (97, 17878),

Gene: PeggyLeg03\_21 Start: 16977, Stop: 17933, Start Num: 13

Candidate Starts for PeggyLeg03\_21:

(4, 16905), (8, 16950), (Start: 13 @16977 has 33 MA's), (15, 16989), (17, 16998), (42, 17247), (53, 17334), (61, 17412), (67, 17454), (73, 17649), (78, 17736), (88, 17823), (97, 17916),

Gene: Persistence\_21 Start: 16854, Stop: 17816, Start Num: 13

Candidate Starts for Persistence\_21:

(3, 16743), (4, 16782), (7, 16803), (8, 16827), (Start: 13 @16854 has 33 MA's), (14, 16863), (17, 16875), (18, 16908), (35, 17064), (38, 17091), (42, 17124), (48, 17160), (53, 17217), (61, 17295), (80, 17631), (83, 17646), (85, 17652), (91, 17733), (97, 17799),

Gene: PhluffyCoco\_18 Start: 14180, Stop: 15139, Start Num: 11

Candidate Starts for PhluffyCoco\_18:

(Start: 11 @14180 has 8 MA's), (19, 14252), (24, 14279), (26, 14294), (32, 14348), (35, 14396), (40, 14450), (47, 14477), (53, 14543), (54, 14549), (58, 14588), (60, 14609), (65, 14651), (78, 14942), (79, 14951), (80, 14954), (83, 14969), (89, 15032), (92, 15080),

Gene: Phrank15\_21 Start: 16867, Stop: 17826, Start Num: 13

Candidate Starts for Phrank15\_21:

(Start: 13 @16867 has 33 MA's), (14, 16876), (17, 16888), (41, 17131), (42, 17137), (43, 17146), (46, 17152), (48, 17173), (61, 17302), (73, 17542), (77, 17584), (78, 17629), (88, 17716), (97, 17809),

Gene: Polka\_19 Start: 14469, Stop: 15428, Start Num: 10

Candidate Starts for Polka\_19:

(Start: 10 @14469 has 7 MA's), (Start: 11 @14475 has 8 MA's), (19, 14550), (21, 14559), (23, 14574), (30, 14628), (32, 14646), (34, 14688), (35, 14694), (47, 14775), (51, 14826), (52, 14829), (53, 14841), (58, 14886), (64, 14940), (69, 14988), (70, 15036), (72, 15102), (78, 15231), (80, 15243), (83, 15258), (84, 15261), (91, 15345), (92, 15369), (93, 15372), (96, 15405),

Gene: Pucara\_21 Start: 16938, Stop: 17894, Start Num: 13

Candidate Starts for Pucara\_21:

(8, 16911), (Start: 13 @16938 has 33 MA's), (17, 16959), (28, 17052), (42, 17208), (45, 17220), (53, 17295), (61, 17373), (66, 17406), (67, 17415), (73, 17610), (78, 17697), (97, 17877),

Gene: RadFad\_22 Start: 16933, Stop: 17892, Start Num: 13

Candidate Starts for RadFad\_22:

(Start: 13 @16933 has 33 MA's), (14, 16942), (41, 17197), (42, 17203), (43, 17212), (46, 17218), (48, 17239), (61, 17368), (73, 17608), (78, 17695), (80, 17707), (88, 17782), (90, 17788), (97, 17875),

Gene: Raphaella\_22 Start: 16933, Stop: 17892, Start Num: 13

Candidate Starts for Raphaella\_22:

(Start: 13 @16933 has 33 MA's), (14, 16942), (41, 17197), (42, 17203), (43, 17212), (46, 17218), (48, 17239), (61, 17368), (73, 17608), (78, 17695), (88, 17782), (97, 17875),

Gene: RedFox\_18 Start: 14180, Stop: 15139, Start Num: 11

Candidate Starts for RedFox\_18:

(Start: 11 @14180 has 8 MA's), (19, 14252), (24, 14279), (26, 14294), (32, 14348), (35, 14396), (40, 14450), (47, 14477), (53, 14543), (54, 14549), (58, 14588), (60, 14609), (65, 14651), (78, 14942), (79, 14951), (80, 14954), (83, 14969), (89, 15032), (92, 15080),

Gene: Renna12\_19 Start: 14524, Stop: 15489, Start Num: 11

Candidate Starts for Renna12\_19:

(Start: 11 @14524 has 8 MA's), (19, 14596), (23, 14620), (24, 14623), (26, 14638), (30, 14674), (32, 14692), (35, 14740), (40, 14794), (47, 14821), (53, 14887), (54, 14893), (78, 15292), (80, 15304), (83, 15319), (89, 15382), (91, 15406), (92, 15430),

Gene: Richie\_22 Start: 16948, Stop: 17907, Start Num: 13

Candidate Starts for Richie\_22:

(Start: 13 @16948 has 33 MA's), (14, 16957), (17, 16969), (41, 17212), (42, 17218), (43, 17227), (46, 17233), (48, 17254), (61, 17383), (73, 17623), (78, 17710), (85, 17743), (88, 17797), (97, 17890),

Gene: Ruchi\_19 Start: 15868, Stop: 16809, Start Num: 13

Candidate Starts for Ruchi\_19:

(Start: 12 @15865 has 2 MA's), (Start: 13 @15868 has 33 MA's), (16, 15886), (19, 15934), (23, 15958), (25, 15967), (29, 16009), (31, 16027), (32, 16030), (35, 16078), (44, 16150), (53, 16222), (64, 16321), (83, 16639), (86, 16684), (87, 16696), (92, 16750),

Gene: Sakai\_22 Start: 16942, Stop: 17901, Start Num: 13

Candidate Starts for Sakai\_22:

(Start: 13 @16942 has 33 MA's), (14, 16951), (41, 17206), (42, 17212), (43, 17221), (46, 17227), (48, 17248), (61, 17377), (73, 17617), (78, 17704), (88, 17791), (97, 17884),

Gene: Seahorse\_23 Start: 17300, Stop: 18259, Start Num: 13

Candidate Starts for Seahorse\_23:

(Start: 13 @17300 has 33 MA's), (14, 17309), (17, 17321), (42, 17570), (43, 17579), (46, 17585), (48, 17606), (61, 17735), (78, 18062), (97, 18242),

Gene: SpicyFrank\_22 Start: 17010, Stop: 17969, Start Num: 13

Candidate Starts for SpicyFrank\_22:

(4, 16938), (7, 16959), (8, 16983), (Start: 13 @17010 has 33 MA's), (14, 17019), (17, 17031), (28, 17124), (41, 17274), (48, 17316), (53, 17367), (61, 17445), (73, 17685), (77, 17727), (78, 17772), (82, 17793), (97, 17952),

Gene: TaylorSipht\_19 Start: 14602, Stop: 15540, Start Num: 13

Candidate Starts for TaylorSipht\_19:

(Start: 13 @14602 has 33 MA's), (19, 14668), (21, 14677), (25, 14701), (29, 14743), (32, 14764), (35, 14812), (58, 15001), (62, 15034), (63, 15046), (77, 15295), (92, 15481), (94, 15493), (96, 15517),

Gene: ThayneTheZag\_22 Start: 17101, Stop: 18063, Start Num: 13

Candidate Starts for ThayneTheZag\_22:

(4, 17029), (7, 17050), (8, 17074), (Start: 13 @17101 has 33 MA's), (14, 17110), (17, 17122), (18, 17155), (27, 17212), (28, 17215), (33, 17269), (35, 17311), (38, 17338), (39, 17356), (42, 17371), (48, 17407), (53, 17464), (77, 17821), (97, 18046),

Gene: Tiff81\_24 Start: 17028, Stop: 17987, Start Num: 13

Candidate Starts for Tiff81\_24:

(Start: 13 @17028 has 33 MA's), (14, 17037), (17, 17049), (41, 17292), (42, 17298), (43, 17307), (46, 17313), (48, 17334), (61, 17463), (78, 17790), (97, 17970),

Gene: Vulpecula\_19 Start: 15323, Stop: 16267, Start Num: 12

Candidate Starts for Vulpecula\_19:

(Start: 12 @15323 has 2 MA's), (Start: 13 @15326 has 33 MA's), (16, 15344), (19, 15392), (23, 15416), (25, 15425), (29, 15467), (31, 15485), (32, 15488), (35, 15536), (44, 15608), (53, 15680), (64, 15779), (83, 16097), (86, 16142), (92, 16208),

Gene: YoungHarleezy\_22 Start: 16946, Stop: 17905, Start Num: 13

Candidate Starts for YoungHarleezy\_22:

(Start: 13 @16946 has 33 MA's), (14, 16955), (41, 17210), (42, 17216), (43, 17225), (46, 17231), (48, 17252), (61, 17381), (73, 17621), (77, 17663), (78, 17708), (88, 17795), (97, 17888),