

Pham 157883



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 157883 Report

This analysis was run 04/13/24 on database version 558.

Pham number 157883 has 58 members, 19 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 : Melons\_20, Kepler\_19, Daob\_20, Coral\_19, Cote\_20
- Track 9 : Lunar\_20, Amelia\_20, HannahPhantana\_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 : Renna12\_19
- Track 16 : KHumphrey\_18, Juno112\_18
- Track 17 : Andrew\_19
- Track 18 : Aikyam\_22
- Track 19 : CookieBear\_23, MidnightRain\_22, YoungHarleezy\_22
- Track 20 : Auxilium\_22, Gorpy\_22, Raphaella\_23, BillyTP\_22, Sakai\_22
- Track 21 : Persistence\_21
- Track 22 : Tiff81\_24
- Track 23 : Globfish\_22
- Track 24 : Seahorse\_23
- Track 25 : Anekin\_22
- Track 26 : Hestia\_22
- Track 27 : RadFad\_22, Hillester\_22
- Track 28 : Phrank15\_22, Isolde\_22
- Track 29 : BenchScraper\_22, Richie\_22
- Track 30 : Judy\_22
- Track 31 : Eileen\_21, Peas\_21
- Track 32 : Bridgette\_21, Karkharias\_21
- Track 33 : ChuckDuck\_21
- Track 34 : PeggyLeg03\_21
- Track 35 : GlobiWarming\_21
- Track 36 : Pucara\_21
- Track 37 : 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 10, it was called in 31 of the 39 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Aikyam\_22, Amelia\_20, Andrew\_19, Anekin\_22, 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, HannahPhantana\_20, Hestia\_22, Hillester\_22, Isolde\_22, Jamun\_19, Judy\_22, Juno112\_18, KHumphrey\_18, Karkharias\_21, Kuleana\_19, Leona\_18, Lunar\_20, MidnightRain\_22, Orcanus\_19, Peas\_21, PeggyLeg03\_21, Persistence\_21, PhluffyCoco\_18, Phrank15\_22, Pucara\_21, RadFad\_22, Raphaella\_23, RedFox\_18, Renna12\_19, Richie\_22, Ruchi\_19, Sakai\_22, Seahorse\_23, TaylorSipht\_19, Tiff81\_24, YoungHarleezy\_22,

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

- Coral\_19, Cote\_20, Daob\_20, Kepler\_19, LittleTokyo\_19, Melons\_20, Polka\_19, Vulpecula\_19,

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

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

Start 8:

- Found in 9 of 58 ( 15.5% ) of genes in pham
- Manual Annotations of this start: 6 of 39
- Called 66.7% of time when present
- Phage (with cluster) where this start called: Coral\_19 (AS2), Cote\_20 (AS2), Daob\_20 (AS2), Kepler\_19 (AS2), Melons\_20 (AS2), Polka\_19 (AS2),

Start 9:

- Found in 7 of 58 ( 12.1% ) of genes in pham
- Manual Annotations of this start: 2 of 39
- Called 28.6% of time when present
- Phage (with cluster) where this start called: LittleTokyo\_19 (AS2), Vulpecula\_19 (AS1),

Start 10:

- Found in 58 of 58 ( 100.0% ) of genes in pham
- Manual Annotations of this start: 31 of 39
- Called 86.2% of time when present
- Phage (with cluster) where this start called: Aikyam\_22 (AY), Amelia\_20 (AS2), Andrew\_19 (AS3), Anekin\_22 (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), HannahPhantana\_20 (AS2), Hestia\_22 (AY), Hillester\_22 (AY),

Isolde\_22 (AY), Jamun\_19 (AS1), Judy\_22 (FA), Juno112\_18 (AS3), KHumphrey\_18 (AS3), Karkharias\_21 (FA), Kuleana\_19 (AS2), Leona\_18 (AS3), Lunar\_20 (AS2), MidnightRain\_22 (AY), Orcanus\_19 (AS1), Peas\_21 (FA), PeggyLeg03\_21 (FA), Persistence\_21 (AY), PhluffyCoco\_18 (AS3), Phrank15\_22 (AY), Pucara\_21 (FA), RadFad\_22 (AY), Raphaella\_23 (AY), RedFox\_18 (AS3), Renna12\_19 (AS3), Richie\_22 (AY), Ruchi\_19 (AS1), Sakai\_22 (AY), Seahorse\_23 (AY), TaylorSipht\_19 (AS1), Tiff81\_24 (AY), YoungHarleezy\_22 (AY),

### **Summary by clusters:**

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

Info for manual annotations of cluster AS1:

- Start number 9 was manually annotated 1 time for cluster AS1.
- Start number 10 was manually annotated 7 times for cluster AS1.

Info for manual annotations of cluster AS2:

- Start number 8 was manually annotated 6 times for cluster AS2.
- Start number 9 was manually annotated 1 time for cluster AS2.
- Start number 10 was manually annotated 3 times for cluster AS2.

Info for manual annotations of cluster AS3:

- Start number 10 was manually annotated 4 times for cluster AS3.

Info for manual annotations of cluster AY:

- Start number 10 was manually annotated 10 times for cluster AY.

Info for manual annotations of cluster FA:

- Start number 10 was manually annotated 7 times for cluster FA.

### **Gene Information:**

Gene: Aikyam\_22 Start: 16934, Stop: 17893, Start Num: 10

Candidate Starts for Aikyam\_22:

(Start: 10 @16934 has 31 MA's), (11, 16943), (36, 17198), (37, 17204), (38, 17213), (40, 17216), (41, 17219), (43, 17240), (56, 17369), (68, 17609), (74, 17696), (83, 17783), (92, 17876),

Gene: Amelia\_20 Start: 14633, Stop: 15586, Start Num: 10

Candidate Starts for Amelia\_20:

(1, 14417), (4, 14570), (Start: 8 @14627 has 6 MA's), (Start: 10 @14633 has 31 MA's), (16, 14708), (18, 14717), (20, 14732), (22, 14741), (25, 14783), (26, 14786), (28, 14804), (29, 14846), (30, 14852), (42, 14933), (46, 14984), (47, 14987), (48, 14999), (53, 15044), (59, 15098), (64, 15146), (65, 15194), (67, 15260), (74, 15389), (76, 15401), (78, 15416), (79, 15419), (86, 15503), (87, 15527), (88, 15530), (91, 15563),

Gene: Andrew\_19 Start: 14644, Stop: 15597, Start Num: 10

Candidate Starts for Andrew\_19:

(Start: 10 @14644 has 31 MA's), (16, 14716), (18, 14725), (20, 14740), (21, 14743), (26, 14794), (28, 14812), (35, 14914), (42, 14941), (47, 14995), (48, 15007), (49, 15013), (53, 15052), (55, 15073), (60, 15109), (66, 15232), (69, 15328), (72, 15352), (74, 15400), (76, 15412), (78, 15427), (81, 15472), (86, 15514), (87, 15538),

Gene: Anekin\_22 Start: 16896, Stop: 17858, Start Num: 10

Candidate Starts for Anekin\_22:

(2, 16785), (5, 16845), (6, 16869), (Start: 10 @16896 has 31 MA's), (11, 16905), (14, 16917), (15, 16950), (24, 17010), (30, 17106), (31, 17109), (33, 17133), (34, 17151), (37, 17166), (76, 17673), (83, 17748), (84, 17751), (92, 17841),

Gene: Auxilium\_22 Start: 16933, Stop: 17892, Start Num: 10

Candidate Starts for Auxilium\_22:

(Start: 10 @16933 has 31 MA's), (11, 16942), (36, 17197), (37, 17203), (38, 17212), (41, 17218), (43, 17239), (56, 17368), (68, 17608), (74, 17695), (83, 17782), (92, 17875),

Gene: Basilisk\_19 Start: 15922, Stop: 16863, Start Num: 10

Candidate Starts for Basilisk\_19:

(Start: 10 @15922 has 31 MA's), (13, 15940), (16, 15988), (20, 16012), (22, 16021), (25, 16063), (27, 16081), (28, 16084), (30, 16132), (39, 16204), (48, 16276), (59, 16375), (78, 16693), (81, 16738), (87, 16804),

Gene: BenchScraper\_22 Start: 16948, Stop: 17907, Start Num: 10

Candidate Starts for BenchScraper\_22:

(Start: 10 @16948 has 31 MA's), (11, 16957), (14, 16969), (36, 17212), (37, 17218), (38, 17227), (41, 17233), (43, 17254), (56, 17383), (68, 17623), (74, 17710), (80, 17743), (83, 17797), (92, 17890),

Gene: BillyTP\_22 Start: 16717, Stop: 17676, Start Num: 10

Candidate Starts for BillyTP\_22:

(Start: 10 @16717 has 31 MA's), (11, 16726), (36, 16981), (37, 16987), (38, 16996), (41, 17002), (43, 17023), (56, 17152), (68, 17392), (74, 17479), (83, 17566), (92, 17659),

Gene: Bridgette\_21 Start: 16995, Stop: 17957, Start Num: 10

Candidate Starts for Bridgette\_21:

(3, 16923), (6, 16968), (Start: 10 @16995 has 31 MA's), (14, 17016), (20, 17085), (33, 17232), (34, 17250), (37, 17265), (43, 17301), (48, 17358), (50, 17367), (62, 17478), (68, 17673), (74, 17760), (92, 17940),

Gene: Brynnie\_19 Start: 15734, Stop: 16675, Start Num: 10

Candidate Starts for Brynnie\_19:

(Start: 9 @15731 has 2 MA's), (Start: 10 @15734 has 31 MA's), (13, 15752), (16, 15800), (20, 15824), (22, 15833), (25, 15875), (27, 15893), (28, 15896), (30, 15944), (39, 16016), (48, 16088), (59, 16187), (78, 16505), (81, 16550), (87, 16616),

Gene: Chickaboom\_18 Start: 14660, Stop: 15601, Start Num: 10

Candidate Starts for Chickaboom\_18:

(Start: 9 @14657 has 2 MA's), (Start: 10 @14660 has 31 MA's), (13, 14678), (16, 14726), (20, 14750), (22, 14759), (25, 14801), (27, 14819), (28, 14822), (30, 14870), (39, 14942), (48, 15014), (59, 15113), (78, 15431), (81, 15476), (87, 15542),

Gene: ChuckDuck\_21 Start: 16837, Stop: 17793, Start Num: 10

Candidate Starts for ChuckDuck\_21:

(6, 16810), (Start: 10 @16837 has 31 MA's), (14, 16858), (26, 16981), (37, 17107), (51, 17230), (52, 17233), (56, 17272), (61, 17305), (62, 17314), (68, 17509), (83, 17683), (92, 17776),

Gene: Constance\_21 Start: 16977, Stop: 17933, Start Num: 10

Candidate Starts for Constance\_21:

(3, 16905), (6, 16950), (Start: 10 @16977 has 31 MA's), (14, 16998), (37, 17247), (48, 17334), (56, 17412), (62, 17454), (68, 17649), (74, 17736), (83, 17823), (92, 17916),

Gene: CookieBear\_23 Start: 16933, Stop: 17892, Start Num: 10

Candidate Starts for CookieBear\_23:

(Start: 10 @16933 has 31 MA's), (11, 16942), (36, 17197), (37, 17203), (38, 17212), (41, 17218), (43, 17239), (56, 17368), (68, 17608), (73, 17650), (74, 17695), (83, 17782), (92, 17875),

Gene: Coral\_19 Start: 14466, Stop: 15425, Start Num: 8

Candidate Starts for Coral\_19:

(1, 14256), (4, 14409), (Start: 8 @14466 has 6 MA's), (Start: 10 @14472 has 31 MA's), (16, 14547), (18, 14556), (20, 14571), (22, 14580), (25, 14622), (26, 14625), (28, 14643), (29, 14685), (30, 14691), (42, 14772), (46, 14823), (47, 14826), (48, 14838), (53, 14883), (59, 14937), (64, 14985), (65, 15033), (67, 15099), (74, 15228), (76, 15240), (78, 15255), (79, 15258), (86, 15342), (87, 15366), (88, 15369), (91, 15402),

Gene: Cote\_20 Start: 14627, Stop: 15586, Start Num: 8

Candidate Starts for Cote\_20:

(1, 14417), (4, 14570), (Start: 8 @14627 has 6 MA's), (Start: 10 @14633 has 31 MA's), (16, 14708), (18, 14717), (20, 14732), (22, 14741), (25, 14783), (26, 14786), (28, 14804), (29, 14846), (30, 14852), (42, 14933), (46, 14984), (47, 14987), (48, 14999), (53, 15044), (59, 15098), (64, 15146), (65, 15194), (67, 15260), (74, 15389), (76, 15401), (78, 15416), (79, 15419), (86, 15503), (87, 15527), (88, 15530), (91, 15563),

Gene: Daob\_20 Start: 14630, Stop: 15589, Start Num: 8

Candidate Starts for Daob\_20:

(1, 14420), (4, 14573), (Start: 8 @14630 has 6 MA's), (Start: 10 @14636 has 31 MA's), (16, 14711), (18, 14720), (20, 14735), (22, 14744), (25, 14786), (26, 14789), (28, 14807), (29, 14849), (30, 14855), (42, 14936), (46, 14987), (47, 14990), (48, 15002), (53, 15047), (59, 15101), (64, 15149), (65, 15197), (67, 15263), (74, 15392), (76, 15404), (78, 15419), (79, 15422), (86, 15506), (87, 15530), (88, 15533), (91, 15566),

Gene: Eesa\_19 Start: 15885, Stop: 16823, Start Num: 10

Candidate Starts for Eesa\_19:

(Start: 10 @15885 has 31 MA's), (16, 15951), (18, 15960), (19, 15969), (25, 16026), (26, 16029), (28, 16047), (30, 16095), (34, 16140), (35, 16149), (46, 16224), (48, 16239), (53, 16284), (58, 16329), (72, 16578), (78, 16653), (81, 16698), (87, 16764), (89, 16776), (91, 16800),

Gene: Eileen\_21 Start: 16939, Stop: 17895, Start Num: 10

Candidate Starts for Eileen\_21:

(Start: 10 @16939 has 31 MA's), (14, 16960), (24, 17053), (37, 17209), (40, 17221), (48, 17296), (56, 17374), (61, 17407), (62, 17416), (68, 17611), (74, 17698), (92, 17878),

Gene: Globfish\_22 Start: 17006, Stop: 17965, Start Num: 10

Candidate Starts for Globfish\_22:

(2, 16895), (3, 16934), (5, 16955), (6, 16979), (Start: 10 @17006 has 31 MA's), (11, 17015), (14, 17027), (24, 17120), (43, 17312), (48, 17363), (56, 17441), (68, 17681), (73, 17723), (74, 17768), (76, 17780), (83, 17855), (92, 17948),

Gene: GlobiWarming\_21 Start: 16931, Stop: 17893, Start Num: 10

Candidate Starts for GlobiWarming\_21:

(6, 16904), (Start: 10 @16931 has 31 MA's), (14, 16952), (20, 17021), (33, 17168), (34, 17186), (37, 17201), (43, 17237), (45, 17258), (48, 17294), (50, 17303), (62, 17414), (68, 17609), (74, 17696), (92,

17876),

Gene: Gorpy\_22 Start: 16942, Stop: 17901, Start Num: 10

Candidate Starts for Gorpy\_22:

(Start: 10 @16942 has 31 MA's), (11, 16951), (36, 17206), (37, 17212), (38, 17221), (41, 17227), (43, 17248), (56, 17377), (68, 17617), (74, 17704), (83, 17791), (92, 17884),

Gene: HannahPhantana\_20 Start: 14636, Stop: 15589, Start Num: 10

Candidate Starts for HannahPhantana\_20:

(1, 14420), (4, 14573), (Start: 8 @14630 has 6 MA's), (Start: 10 @14636 has 31 MA's), (16, 14711), (18, 14720), (20, 14735), (22, 14744), (25, 14786), (26, 14789), (28, 14807), (29, 14849), (30, 14855), (42, 14936), (46, 14987), (47, 14990), (48, 15002), (53, 15047), (59, 15101), (64, 15149), (65, 15197), (67, 15263), (74, 15392), (76, 15404), (78, 15419), (79, 15422), (86, 15506), (87, 15530), (88, 15533), (91, 15566),

Gene: Hestia\_22 Start: 17111, Stop: 18070, Start Num: 10

Candidate Starts for Hestia\_22:

(Start: 10 @17111 has 31 MA's), (11, 17120), (36, 17375), (37, 17381), (38, 17390), (41, 17396), (43, 17417), (48, 17468), (56, 17546), (68, 17786), (74, 17873), (83, 17960), (92, 18053),

Gene: Hillester\_22 Start: 16933, Stop: 17892, Start Num: 10

Candidate Starts for Hillester\_22:

(Start: 10 @16933 has 31 MA's), (11, 16942), (36, 17197), (37, 17203), (38, 17212), (41, 17218), (43, 17239), (56, 17368), (68, 17608), (74, 17695), (76, 17707), (83, 17782), (85, 17788), (92, 17875),

Gene: Isolde\_22 Start: 16768, Stop: 17727, Start Num: 10

Candidate Starts for Isolde\_22:

(Start: 10 @16768 has 31 MA's), (11, 16777), (14, 16789), (36, 17032), (37, 17038), (38, 17047), (41, 17053), (43, 17074), (56, 17203), (68, 17443), (73, 17485), (74, 17530), (83, 17617), (92, 17710),

Gene: Jamun\_19 Start: 15328, Stop: 16269, Start Num: 10

Candidate Starts for Jamun\_19:

(Start: 9 @15325 has 2 MA's), (Start: 10 @15328 has 31 MA's), (13, 15346), (16, 15394), (20, 15418), (22, 15427), (25, 15469), (27, 15487), (28, 15490), (30, 15538), (39, 15610), (48, 15682), (59, 15781), (78, 16099), (81, 16144), (87, 16210),

Gene: Judy\_22 Start: 17248, Stop: 18204, Start Num: 10

Candidate Starts for Judy\_22:

(3, 17176), (6, 17221), (Start: 10 @17248 has 31 MA's), (14, 17269), (37, 17518), (48, 17605), (56, 17683), (62, 17725), (68, 17920), (70, 17944), (74, 18007), (92, 18187),

Gene: Juno112\_18 Start: 14181, Stop: 15140, Start Num: 10

Candidate Starts for Juno112\_18:

(Start: 10 @14181 has 31 MA's), (16, 14253), (21, 14280), (23, 14295), (28, 14349), (30, 14397), (35, 14451), (42, 14478), (48, 14544), (49, 14550), (53, 14589), (55, 14610), (74, 14943), (75, 14952), (76, 14955), (78, 14970), (84, 15033), (87, 15081),

Gene: KHumphrey\_18 Start: 14178, Stop: 15137, Start Num: 10

Candidate Starts for KHumphrey\_18:

(Start: 10 @14178 has 31 MA's), (16, 14250), (21, 14277), (23, 14292), (28, 14346), (30, 14394), (35, 14448), (42, 14475), (48, 14541), (49, 14547), (53, 14586), (55, 14607), (74, 14940), (75, 14949), (76, 14952), (78, 14967), (84, 15030), (87, 15078),

Gene: Karkharias\_21 Start: 16935, Stop: 17897, Start Num: 10

Candidate Starts for Karkharias\_21:

(3, 16863), (6, 16908), (Start: 10 @16935 has 31 MA's), (14, 16956), (20, 17025), (33, 17172), (34, 17190), (37, 17205), (43, 17241), (48, 17298), (50, 17307), (62, 17418), (68, 17613), (74, 17700), (92, 17880),

Gene: Kepler\_19 Start: 14465, Stop: 15424, Start Num: 8

Candidate Starts for Kepler\_19:

(1, 14255), (4, 14408), (Start: 8 @14465 has 6 MA's), (Start: 10 @14471 has 31 MA's), (16, 14546), (18, 14555), (20, 14570), (22, 14579), (25, 14621), (26, 14624), (28, 14642), (29, 14684), (30, 14690), (42, 14771), (46, 14822), (47, 14825), (48, 14837), (53, 14882), (59, 14936), (64, 14984), (65, 15032), (67, 15098), (74, 15227), (76, 15239), (78, 15254), (79, 15257), (86, 15341), (87, 15365), (88, 15368), (91, 15401),

Gene: Kuleana\_19 Start: 14642, Stop: 15589, Start Num: 10

Candidate Starts for Kuleana\_19:

(1, 14432), (4, 14585), (Start: 9 @14639 has 2 MA's), (Start: 10 @14642 has 31 MA's), (16, 14708), (22, 14741), (23, 14750), (25, 14783), (28, 14804), (30, 14852), (44, 14948), (63, 15116), (65, 15194), (71, 15338), (74, 15389), (77, 15407), (87, 15527), (90, 15548), (91, 15563),

Gene: Leona\_18 Start: 14234, Stop: 15199, Start Num: 10

Candidate Starts for Leona\_18:

(Start: 10 @14234 has 31 MA's), (16, 14306), (21, 14333), (22, 14339), (23, 14348), (26, 14384), (28, 14402), (30, 14450), (35, 14504), (42, 14531), (44, 14549), (46, 14582), (54, 14663), (74, 15002), (75, 15011), (76, 15014), (78, 15029), (87, 15140),

Gene: LittleTokyo\_19 Start: 14585, Stop: 15535, Start Num: 9

Candidate Starts for LittleTokyo\_19:

(7, 14576), (Start: 9 @14585 has 2 MA's), (Start: 10 @14588 has 31 MA's), (16, 14654), (17, 14657), (21, 14681), (22, 14687), (23, 14696), (25, 14729), (28, 14750), (32, 14816), (35, 14852), (44, 14894), (47, 14930), (48, 14942), (49, 14948), (63, 15062), (66, 15170), (71, 15284), (74, 15335), (77, 15353), (87, 15473), (89, 15485), (90, 15494), (91, 15509),

Gene: Lunar\_20 Start: 14633, Stop: 15586, Start Num: 10

Candidate Starts for Lunar\_20:

(1, 14417), (4, 14570), (Start: 8 @14627 has 6 MA's), (Start: 10 @14633 has 31 MA's), (16, 14708), (18, 14717), (20, 14732), (22, 14741), (25, 14783), (26, 14786), (28, 14804), (29, 14846), (30, 14852), (42, 14933), (46, 14984), (47, 14987), (48, 14999), (53, 15044), (59, 15098), (64, 15146), (65, 15194), (67, 15260), (74, 15389), (76, 15401), (78, 15416), (79, 15419), (86, 15503), (87, 15527), (88, 15530), (91, 15563),

Gene: Melons\_20 Start: 14627, Stop: 15586, Start Num: 8

Candidate Starts for Melons\_20:

(1, 14417), (4, 14570), (Start: 8 @14627 has 6 MA's), (Start: 10 @14633 has 31 MA's), (16, 14708), (18, 14717), (20, 14732), (22, 14741), (25, 14783), (26, 14786), (28, 14804), (29, 14846), (30, 14852), (42, 14933), (46, 14984), (47, 14987), (48, 14999), (53, 15044), (59, 15098), (64, 15146), (65, 15194), (67, 15260), (74, 15389), (76, 15401), (78, 15416), (79, 15419), (86, 15503), (87, 15527), (88, 15530), (91, 15563),

Gene: MidnightRain\_22 Start: 16932, Stop: 17891, Start Num: 10

Candidate Starts for MidnightRain\_22:

(Start: 10 @16932 has 31 MA's), (11, 16941), (36, 17196), (37, 17202), (38, 17211), (41, 17217), (43, 17238), (56, 17367), (68, 17607), (73, 17649), (74, 17694), (83, 17781), (92, 17874),



Gene: Orcanus\_19 Start: 15585, Stop: 16523, Start Num: 10

Candidate Starts for Orcanus\_19:

(Start: 10 @15585 has 31 MA's), (16, 15651), (18, 15660), (19, 15669), (25, 15726), (26, 15729), (28, 15747), (30, 15795), (34, 15840), (35, 15849), (46, 15924), (48, 15939), (49, 15945), (53, 15984), (58, 16029), (72, 16278), (78, 16353), (81, 16398), (87, 16464), (89, 16476), (91, 16500),

Gene: Peas\_21 Start: 16939, Stop: 17895, Start Num: 10

Candidate Starts for Peas\_21:

(Start: 10 @16939 has 31 MA's), (14, 16960), (24, 17053), (37, 17209), (40, 17221), (48, 17296), (56, 17374), (61, 17407), (62, 17416), (68, 17611), (74, 17698), (92, 17878),

Gene: PeggyLeg03\_21 Start: 16977, Stop: 17933, Start Num: 10

Candidate Starts for PeggyLeg03\_21:

(3, 16905), (6, 16950), (Start: 10 @16977 has 31 MA's), (12, 16989), (14, 16998), (37, 17247), (48, 17334), (56, 17412), (62, 17454), (68, 17649), (74, 17736), (83, 17823), (92, 17916),

Gene: Persistence\_21 Start: 16854, Stop: 17816, Start Num: 10

Candidate Starts for Persistence\_21:

(2, 16743), (3, 16782), (5, 16803), (6, 16827), (Start: 10 @16854 has 31 MA's), (11, 16863), (14, 16875), (15, 16908), (30, 17064), (33, 17091), (37, 17124), (43, 17160), (48, 17217), (56, 17295), (76, 17631), (78, 17646), (80, 17652), (86, 17733), (92, 17799),

Gene: PhluffyCoco\_18 Start: 14180, Stop: 15139, Start Num: 10

Candidate Starts for PhluffyCoco\_18:

(Start: 10 @14180 has 31 MA's), (16, 14252), (21, 14279), (23, 14294), (28, 14348), (30, 14396), (35, 14450), (42, 14477), (48, 14543), (49, 14549), (53, 14588), (55, 14609), (60, 14651), (74, 14942), (75, 14951), (76, 14954), (78, 14969), (84, 15032), (87, 15080),

Gene: Phrank15\_22 Start: 16867, Stop: 17826, Start Num: 10

Candidate Starts for Phrank15\_22:

(Start: 10 @16867 has 31 MA's), (11, 16876), (14, 16888), (36, 17131), (37, 17137), (38, 17146), (41, 17152), (43, 17173), (56, 17302), (68, 17542), (73, 17584), (74, 17629), (83, 17716), (92, 17809),

Gene: Polka\_19 Start: 14469, Stop: 15428, Start Num: 8

Candidate Starts for Polka\_19:

(Start: 8 @14469 has 6 MA's), (Start: 10 @14475 has 31 MA's), (16, 14550), (18, 14559), (20, 14574), (26, 14628), (28, 14646), (29, 14688), (30, 14694), (42, 14775), (46, 14826), (47, 14829), (48, 14841), (53, 14886), (59, 14940), (64, 14988), (65, 15036), (67, 15102), (74, 15231), (76, 15243), (78, 15258), (79, 15261), (86, 15345), (87, 15369), (88, 15372), (91, 15405),

Gene: Pucara\_21 Start: 16938, Stop: 17894, Start Num: 10

Candidate Starts for Pucara\_21:

(6, 16911), (Start: 10 @16938 has 31 MA's), (14, 16959), (24, 17052), (37, 17208), (40, 17220), (48, 17295), (56, 17373), (61, 17406), (62, 17415), (68, 17610), (74, 17697), (92, 17877),

Gene: RadFad\_22 Start: 16933, Stop: 17892, Start Num: 10

Candidate Starts for RadFad\_22:

(Start: 10 @16933 has 31 MA's), (11, 16942), (36, 17197), (37, 17203), (38, 17212), (41, 17218), (43, 17239), (56, 17368), (68, 17608), (74, 17695), (76, 17707), (83, 17782), (85, 17788), (92, 17875),

Gene: Raphaella\_23 Start: 16933, Stop: 17892, Start Num: 10

Candidate Starts for Raphaella\_23:

(Start: 10 @16933 has 31 MA's), (11, 16942), (36, 17197), (37, 17203), (38, 17212), (41, 17218), (43, 17239), (56, 17368), (68, 17608), (74, 17695), (83, 17782), (92, 17875),

Gene: RedFox\_18 Start: 14180, Stop: 15139, Start Num: 10

Candidate Starts for RedFox\_18:

(Start: 10 @14180 has 31 MA's), (16, 14252), (21, 14279), (23, 14294), (28, 14348), (30, 14396), (35, 14450), (42, 14477), (48, 14543), (49, 14549), (53, 14588), (55, 14609), (60, 14651), (74, 14942), (75, 14951), (76, 14954), (78, 14969), (84, 15032), (87, 15080),

Gene: Renna12\_19 Start: 14524, Stop: 15489, Start Num: 10

Candidate Starts for Renna12\_19:

(Start: 10 @14524 has 31 MA's), (16, 14596), (20, 14620), (21, 14623), (23, 14638), (26, 14674), (28, 14692), (30, 14740), (35, 14794), (42, 14821), (48, 14887), (49, 14893), (74, 15292), (76, 15304), (78, 15319), (84, 15382), (86, 15406), (87, 15430),

Gene: Richie\_22 Start: 16948, Stop: 17907, Start Num: 10

Candidate Starts for Richie\_22:

(Start: 10 @16948 has 31 MA's), (11, 16957), (14, 16969), (36, 17212), (37, 17218), (38, 17227), (41, 17233), (43, 17254), (56, 17383), (68, 17623), (74, 17710), (80, 17743), (83, 17797), (92, 17890),

Gene: Ruchi\_19 Start: 15868, Stop: 16809, Start Num: 10

Candidate Starts for Ruchi\_19:

(Start: 9 @15865 has 2 MA's), (Start: 10 @15868 has 31 MA's), (13, 15886), (16, 15934), (20, 15958), (22, 15967), (25, 16009), (27, 16027), (28, 16030), (30, 16078), (39, 16150), (48, 16222), (59, 16321), (78, 16639), (81, 16684), (82, 16696), (87, 16750),

Gene: Sakai\_22 Start: 16942, Stop: 17901, Start Num: 10

Candidate Starts for Sakai\_22:

(Start: 10 @16942 has 31 MA's), (11, 16951), (36, 17206), (37, 17212), (38, 17221), (41, 17227), (43, 17248), (56, 17377), (68, 17617), (74, 17704), (83, 17791), (92, 17884),

Gene: Seahorse\_23 Start: 17300, Stop: 18259, Start Num: 10

Candidate Starts for Seahorse\_23:

(Start: 10 @17300 has 31 MA's), (11, 17309), (14, 17321), (37, 17570), (38, 17579), (41, 17585), (43, 17606), (56, 17735), (74, 18062), (92, 18242),

Gene: TaylorSipht\_19 Start: 14602, Stop: 15540, Start Num: 10

Candidate Starts for TaylorSipht\_19:

(Start: 10 @14602 has 31 MA's), (16, 14668), (18, 14677), (22, 14701), (25, 14743), (28, 14764), (30, 14812), (53, 15001), (57, 15034), (58, 15046), (72, 15295), (87, 15481), (89, 15493), (91, 15517),

Gene: Tiff81\_24 Start: 17028, Stop: 17987, Start Num: 10

Candidate Starts for Tiff81\_24:

(Start: 10 @17028 has 31 MA's), (11, 17037), (14, 17049), (36, 17292), (37, 17298), (38, 17307), (41, 17313), (43, 17334), (56, 17463), (74, 17790), (92, 17970),

Gene: Vulpecula\_19 Start: 15323, Stop: 16267, Start Num: 9

Candidate Starts for Vulpecula\_19:

(Start: 9 @15323 has 2 MA's), (Start: 10 @15326 has 31 MA's), (13, 15344), (16, 15392), (20, 15416), (22, 15425), (25, 15467), (27, 15485), (28, 15488), (30, 15536), (39, 15608), (48, 15680), (59, 15779), (78, 16097), (81, 16142), (87, 16208),

Gene: YoungHarleezy\_22 Start: 16946, Stop: 17905, Start Num: 10

Candidate Starts for YoungHarleezy\_22:

(Start: 10 @16946 has 31 MA's), (11, 16955), (36, 17210), (37, 17216), (38, 17225), (41, 17231), (43, 17252), (56, 17381), (68, 17621), (73, 17663), (74, 17708), (83, 17795), (92, 17888),