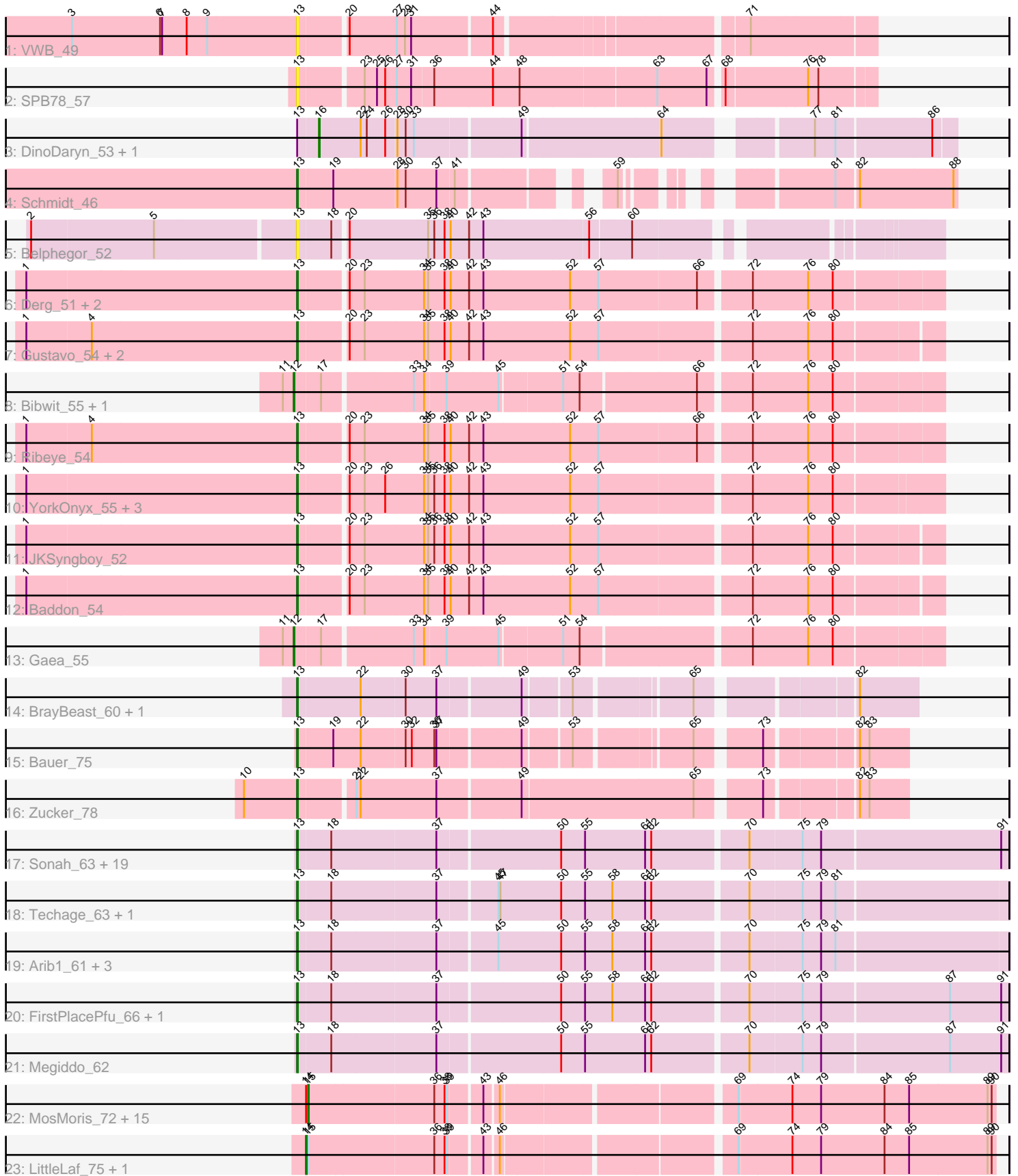


# Pham 163008



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 163008 Report

This analysis was run 05/04/24 on database version 560.

WARNING: Pham size does not match number of genes in report. Either unphamerated genes have been added (by you) or starterator has removed genes due to invalid start codon.

Pham number 163008 has 73 members, 11 are drafts.

Phages represented in each track:

- Track 1 : VWB\_49
- Track 2 : SPB78\_57
- Track 3 : DinoDaryn\_53, Huffy\_53
- Track 4 : Schmidt\_46
- Track 5 : Belphegor\_52
- Track 6 : Derg\_51, Flatwoods\_54, Bizzy\_54
- Track 7 : Gustavo\_54, Saronaya\_54, Tangerine\_53
- Track 8 : Bibwit\_55, Ashertheman\_56
- Track 9 : Ribeye\_54
- Track 10 : YorkOnyx\_55, SchottB\_52, Kwobi\_55, Kroos\_54
- Track 11 : JKSyngboy\_52
- Track 12 : Baddon\_54
- Track 13 : Gaea\_55
- Track 14 : BrayBeast\_60, Shoya\_60
- Track 15 : Bauer\_75
- Track 16 : Zucker\_78
- Track 17 : Sonah\_63, Juniormint\_60, Jung\_63, Atcoo\_64, Zilizebeth\_68, Malithi\_62, Vidya\_61, Shipwreck\_65, StevieRay\_67, HUHilltop\_65, Jebeks\_63, Bogie\_65, Dynamo\_62, Brusacoram\_64, Polkaroo\_64, Pygmy\_66, Thespis\_64, Camster\_63, Phineas\_63, Necropolis\_60
- Track 18 : Techage\_63, Xula\_58
- Track 19 : Arib1\_61, Venti\_60, Bartholomew\_58, QueenHazel\_59
- Track 20 : FirstPlacePfu\_66, GreaseLightnin\_67
- Track 21 : Megiddo\_62
- Track 22 : MosMoris\_72, Raela\_76, Tesla\_72, Beelzebub\_79, JoieB\_76, Corazon\_72, RedRaider77\_75, Marvin\_71, Poise\_76, Clarkson\_76, Caprice\_69, Pringar\_73, Huphlepuuff\_77, VasuNzinga\_74, Blackbeetle\_76, Gattaca\_73
- Track 23 : LittleLaf\_75, Lilbit\_75

***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 41 of the 62 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Arib1\_61, Atcoo\_64, Baddon\_54, Bartholomew\_58, Bauer\_75, Belphegor\_52, Bizzy\_54, Bogie\_65, BrayBeast\_60, Brusacoram\_64, Camster\_63, Derg\_51, Dynamo\_62, FirstPlacePfu\_66, Flatwoods\_54, GreaseLightnin\_67, Gustavo\_54, HUHilltop\_65, JKSyngboy\_52, Jebeks\_63, Jung\_63, Juniormint\_60, Kroos\_54, Kwobi\_55, Malithi\_62, Megiddo\_62, Necropolis\_60, Phineas\_63, Polkaroo\_64, Pygmy\_66, QueenHazel\_59, Ribeye\_54, SPB78\_57, Saronaya\_54, Schmidt\_46, SchottB\_52, Shipwreck\_65, Shoya\_60, Sonah\_63, StevieRay\_67, Tangerine\_53, Techage\_63, Thespis\_64, VWB\_49, Venti\_60, Vidya\_61, Xula\_58, YorkOnyx\_55, Zilizabeth\_68, Zucker\_78,

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

- DinoDaryn\_53, Huffy\_53,

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

- Ashertheman\_56, Beelzebub\_79, Bibwit\_55, Blackbeetle\_76, Caprice\_69, Clarkson\_76, Corazon\_72, Gaea\_55, Gattaca\_73, Huphlepuuff\_77, JoieB\_76, Lilbit\_75, LittleLaf\_75, Marvin\_71, MosMoris\_72, Poise\_76, Pringar\_73, Raela\_76, RedRaider77\_75, Tesla\_72, VasuNzinga\_74,

### Summary by start number:

Start 12:

- Found in 3 of 73 ( 4.1% ) of genes in pham
- Manual Annotations of this start: 3 of 62
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Ashertheman\_56 (DE1), Bibwit\_55 (DE1), Gaea\_55 (DE1),

Start 13:

- Found in 52 of 73 ( 71.2% ) of genes in pham
- Manual Annotations of this start: 41 of 62
- Called 96.2% of time when present
- Phage (with cluster) where this start called: Arib1\_61 (P1), Atcoo\_64 (P1), Baddon\_54 (DE1), Bartholomew\_58 (P1), Bauer\_75 (FN), Belphegor\_52 (DE), Bizzy\_54 (DE1), Bogie\_65 (P1), BrayBeast\_60 (FB), Brusacoram\_64 (P1), Camster\_63 (P1), Derg\_51 (DE1), Dynamo\_62 (P1), FirstPlacePfu\_66 (P1), Flatwoods\_54 (DE1), GreaseLightnin\_67 (P1), Gustavo\_54 (DE1), HUHilltop\_65 (P1), JKSyngboy\_52 (DE1), Jebeks\_63 (P1), Jung\_63 (P1), Juniormint\_60 (P1), Kroos\_54 (DE1), Kwobi\_55 (DE1), Malithi\_62 (P1), Megiddo\_62 (P1), Necropolis\_60 (P1), Phineas\_63 (P1), Polkaroo\_64 (P1), Pygmy\_66 (P1), QueenHazel\_59 (I1), Ribeye\_54 (DE1), SPB78\_57 (BA), Saronaya\_54 (DE1), Schmidt\_46 (CU4), SchottB\_52 (DE1), Shipwreck\_65 (P1), Shoya\_60 (FB), Sonah\_63 (P1), StevieRay\_67 (P1), Tangerine\_53 (DE1), Techage\_63 (P1), Thespis\_64 (P1), VWB\_49 (BA), Venti\_60 (P1), Vidya\_61 (P1), Xula\_58 (I1), YorkOnyx\_55 (DE1), Zilizabeth\_68 (P1), Zucker\_78 (FN),

Start 14:

- Found in 18 of 73 ( 24.7% ) of genes in pham

- Manual Annotations of this start: 1 of 62
- Called 11.1% of time when present
- Phage (with cluster) where this start called: Lilbit\_75 (S), LittleLaf\_75 (S),

Start 15:

- Found in 18 of 73 ( 24.7% ) of genes in pham
- Manual Annotations of this start: 15 of 62
- Called 88.9% of time when present
- Phage (with cluster) where this start called: Beelzebub\_79 (S), Blackbeetle\_76 (S), Caprice\_69 (S), Clarkson\_76 (S), Corazon\_72 (S), Gattaca\_73 (S), Huphlepuuff\_77 (S), JoieB\_76 (S), Marvin\_71 (S), MosMoris\_72 (S), Poise\_76 (S), Pringar\_73 (S), Raela\_76 (S), RedRaider77\_75 (S), Tesla\_72 (S), VasuNzinga\_74 (S),

Start 16:

- Found in 2 of 73 ( 2.7% ) of genes in pham
- Manual Annotations of this start: 2 of 62
- Called 100.0% of time when present
- Phage (with cluster) where this start called: DinoDaryn\_53 (CU1), Huffy\_53 (CU1),

### **Summary by clusters:**

There are 10 clusters represented in this pham: P1, BA, CU1, I1, DE1, DE, FB, S, CU4, FN,

Info for manual annotations of cluster CU1:

- Start number 16 was manually annotated 2 times for cluster CU1.

Info for manual annotations of cluster CU4:

- Start number 13 was manually annotated 1 time for cluster CU4.

Info for manual annotations of cluster DE1:

- Start number 12 was manually annotated 3 times for cluster DE1.
- Start number 13 was manually annotated 9 times for cluster DE1.

Info for manual annotations of cluster FB:

- Start number 13 was manually annotated 2 times for cluster FB.

Info for manual annotations of cluster FN:

- Start number 13 was manually annotated 2 times for cluster FN.

Info for manual annotations of cluster I1:

- Start number 13 was manually annotated 2 times for cluster I1.

Info for manual annotations of cluster P1:

- Start number 13 was manually annotated 25 times for cluster P1.

Info for manual annotations of cluster S:

- Start number 14 was manually annotated 1 time for cluster S.
- Start number 15 was manually annotated 15 times for cluster S.

### **Gene Information:**

Gene: Arib1\_61 Start: 39295, Stop: 40290, Start Num: 13

Candidate Starts for Arib1\_61:

(Start: 13 @39295 has 41 MA's), (18, 39340), (37, 39490), (45, 39571), (50, 39661), (55, 39694), (58, 39733), (61, 39781), (62, 39790), (70, 39922), (75, 39997), (79, 40024), (81, 40045),

Gene: Ashertheman\_56 Start: 44845, Stop: 45732, Start Num: 12

Candidate Starts for Ashertheman\_56:

(11, 44833), (Start: 12 @44845 has 3 MA's), (17, 44881), (33, 45001), (34, 45016), (39, 45046), (45, 45118), (51, 45205), (54, 45229), (66, 45391), (72, 45460), (76, 45541), (80, 45577),

Gene: Atcoo\_64 Start: 42672, Stop: 43670, Start Num: 13

Candidate Starts for Atcoo\_64:

(Start: 13 @42672 has 41 MA's), (18, 42717), (37, 42867), (50, 43038), (55, 43071), (61, 43158), (62, 43167), (70, 43299), (75, 43374), (79, 43401), (91, 43659),

Gene: Baddon\_54 Start: 45452, Stop: 46342, Start Num: 13

Candidate Starts for Baddon\_54:

(1, 45062), (Start: 13 @45452 has 41 MA's), (20, 45512), (23, 45533), (34, 45617), (35, 45623), (38, 45647), (40, 45656), (42, 45683), (43, 45704), (52, 45827), (57, 45866), (72, 46076), (76, 46157), (80, 46193),

Gene: Bartholomew\_58 Start: 38622, Stop: 39617, Start Num: 13

Candidate Starts for Bartholomew\_58:

(Start: 13 @38622 has 41 MA's), (18, 38667), (37, 38817), (45, 38898), (50, 38988), (55, 39021), (58, 39060), (61, 39108), (62, 39117), (70, 39249), (75, 39324), (79, 39351), (81, 39372),

Gene: Bauer\_75 Start: 42042, Stop: 42833, Start Num: 13

Candidate Starts for Bauer\_75:

(Start: 13 @42042 has 41 MA's), (19, 42090), (22, 42129), (30, 42192), (32, 42201), (36, 42234), (37, 42237), (49, 42351), (53, 42414), (65, 42564), (73, 42645), (82, 42765), (83, 42777),

Gene: Beelzebub\_79 Start: 42080, Stop: 43006, Start Num: 15

Candidate Starts for Beelzebub\_79:

(Start: 14 @42077 has 1 MA's), (Start: 15 @42080 has 15 MA's), (36, 42260), (38, 42275), (39, 42278), (43, 42320), (46, 42338), (69, 42635), (74, 42710), (79, 42752), (84, 42845), (85, 42881), (89, 42995), (90, 43001),

Gene: Belphegor\_52 Start: 45051, Stop: 45884, Start Num: 13

Candidate Starts for Belphegor\_52:

(2, 44676), (5, 44853), (Start: 13 @45051 has 41 MA's), (18, 45096), (20, 45111), (35, 45222), (36, 45231), (38, 45246), (40, 45255), (42, 45282), (43, 45303), (56, 45450), (60, 45507),

Gene: Bibwit\_55 Start: 44359, Stop: 45243, Start Num: 12

Candidate Starts for Bibwit\_55:

(11, 44347), (Start: 12 @44359 has 3 MA's), (17, 44395), (33, 44515), (34, 44530), (39, 44560), (45, 44632), (51, 44719), (54, 44743), (66, 44905), (72, 44974), (76, 45055), (80, 45091),

Gene: Bizzy\_54 Start: 44167, Stop: 45060, Start Num: 13

Candidate Starts for Bizzy\_54:

(1, 43777), (Start: 13 @44167 has 41 MA's), (20, 44227), (23, 44248), (34, 44332), (35, 44338), (38, 44362), (40, 44371), (42, 44398), (43, 44419), (52, 44542), (57, 44581), (66, 44722), (72, 44791), (76,

44872), (80, 44908),

Gene: Blackbeetle\_76 Start: 41429, Stop: 42367, Start Num: 15

Candidate Starts for Blackbeetle\_76:

(Start: 14 @41426 has 1 MA's), (Start: 15 @41429 has 15 MA's), (36, 41609), (38, 41624), (39, 41627), (43, 41669), (46, 41687), (69, 41996), (74, 42071), (79, 42113), (84, 42206), (85, 42242), (89, 42356), (90, 42362),

Gene: Bogie\_65 Start: 41654, Stop: 42652, Start Num: 13

Candidate Starts for Bogie\_65:

(Start: 13 @41654 has 41 MA's), (18, 41699), (37, 41849), (50, 42020), (55, 42053), (61, 42140), (62, 42149), (70, 42281), (75, 42356), (79, 42383), (91, 42641),

Gene: BrayBeast\_60 Start: 34355, Stop: 35161, Start Num: 13

Candidate Starts for BrayBeast\_60:

(Start: 13 @34355 has 41 MA's), (22, 34442), (30, 34505), (37, 34550), (49, 34664), (53, 34727), (65, 34877), (82, 35078),

Gene: Brusacoram\_64 Start: 41215, Stop: 42213, Start Num: 13

Candidate Starts for Brusacoram\_64:

(Start: 13 @41215 has 41 MA's), (18, 41260), (37, 41410), (50, 41581), (55, 41614), (61, 41701), (62, 41710), (70, 41842), (75, 41917), (79, 41944), (91, 42202),

Gene: Camster\_63 Start: 40115, Stop: 41113, Start Num: 13

Candidate Starts for Camster\_63:

(Start: 13 @40115 has 41 MA's), (18, 40160), (37, 40310), (50, 40481), (55, 40514), (61, 40601), (62, 40610), (70, 40742), (75, 40817), (79, 40844), (91, 41102),

Gene: Caprice\_69 Start: 41379, Stop: 42305, Start Num: 15

Candidate Starts for Caprice\_69:

(Start: 14 @41376 has 1 MA's), (Start: 15 @41379 has 15 MA's), (36, 41559), (38, 41574), (39, 41577), (43, 41619), (46, 41637), (69, 41934), (74, 42009), (79, 42051), (84, 42144), (85, 42180), (89, 42294), (90, 42300),

Gene: Clarkson\_76 Start: 41760, Stop: 42686, Start Num: 15

Candidate Starts for Clarkson\_76:

(Start: 14 @41757 has 1 MA's), (Start: 15 @41760 has 15 MA's), (36, 41940), (38, 41955), (39, 41958), (43, 42000), (46, 42018), (69, 42315), (74, 42390), (79, 42432), (84, 42525), (85, 42561), (89, 42675), (90, 42681),

Gene: Corazon\_72 Start: 41954, Stop: 42880, Start Num: 15

Candidate Starts for Corazon\_72:

(Start: 14 @41951 has 1 MA's), (Start: 15 @41954 has 15 MA's), (36, 42134), (38, 42149), (39, 42152), (43, 42194), (46, 42212), (69, 42509), (74, 42584), (79, 42626), (84, 42719), (85, 42755), (89, 42869), (90, 42875),

Gene: Derg\_51 Start: 43759, Stop: 44652, Start Num: 13

Candidate Starts for Derg\_51:

(1, 43369), (Start: 13 @43759 has 41 MA's), (20, 43819), (23, 43840), (34, 43924), (35, 43930), (38, 43954), (40, 43963), (42, 43990), (43, 44011), (52, 44134), (57, 44173), (66, 44314), (72, 44383), (76, 44464), (80, 44500),

Gene: DinoDaryn\_53 Start: 33407, Stop: 34255, Start Num: 16

Candidate Starts for DinoDaryn\_53:

(Start: 13 @33380 has 41 MA's), (Start: 16 @33407 has 2 MA's), (22, 33467), (24, 33476), (26, 33503), (28, 33518), (30, 33530), (33, 33542), (49, 33689), (64, 33881), (77, 34058), (81, 34088), (86, 34223),

Gene: Dynamo\_62 Start: 39688, Stop: 40686, Start Num: 13

Candidate Starts for Dynamo\_62:

(Start: 13 @39688 has 41 MA's), (18, 39733), (37, 39883), (50, 40054), (55, 40087), (61, 40174), (62, 40183), (70, 40315), (75, 40390), (79, 40417), (91, 40675),

Gene: FirstPlacePfu\_66 Start: 39281, Stop: 40279, Start Num: 13

Candidate Starts for FirstPlacePfu\_66:

(Start: 13 @39281 has 41 MA's), (18, 39326), (37, 39476), (50, 39647), (55, 39680), (58, 39719), (61, 39767), (62, 39776), (70, 39908), (75, 39983), (79, 40010), (87, 40193), (91, 40268),

Gene: Flatwoods\_54 Start: 44108, Stop: 44998, Start Num: 13

Candidate Starts for Flatwoods\_54:

(1, 43718), (Start: 13 @44108 has 41 MA's), (20, 44168), (23, 44189), (34, 44273), (35, 44279), (38, 44303), (40, 44312), (42, 44339), (43, 44360), (52, 44483), (57, 44522), (66, 44663), (72, 44732), (76, 44813), (80, 44849),

Gene: Gaea\_55 Start: 44145, Stop: 45029, Start Num: 12

Candidate Starts for Gaea\_55:

(11, 44133), (Start: 12 @44145 has 3 MA's), (17, 44181), (33, 44301), (34, 44316), (39, 44346), (45, 44418), (51, 44505), (54, 44529), (72, 44760), (76, 44841), (80, 44877),

Gene: Gattaca\_73 Start: 41533, Stop: 42465, Start Num: 15

Candidate Starts for Gattaca\_73:

(Start: 14 @41530 has 1 MA's), (Start: 15 @41533 has 15 MA's), (36, 41713), (38, 41728), (39, 41731), (43, 41773), (46, 41791), (69, 42094), (74, 42169), (79, 42211), (84, 42304), (85, 42340), (89, 42454), (90, 42460),

Gene: GreaseLightnin\_67 Start: 42069, Stop: 43067, Start Num: 13

Candidate Starts for GreaseLightnin\_67:

(Start: 13 @42069 has 41 MA's), (18, 42114), (37, 42264), (50, 42435), (55, 42468), (58, 42507), (61, 42555), (62, 42564), (70, 42696), (75, 42771), (79, 42798), (87, 42981), (91, 43056),

Gene: Gustavo\_54 Start: 44390, Stop: 45280, Start Num: 13

Candidate Starts for Gustavo\_54:

(1, 44000), (4, 44093), (Start: 13 @44390 has 41 MA's), (20, 44450), (23, 44471), (34, 44555), (35, 44561), (38, 44585), (40, 44594), (42, 44621), (43, 44642), (52, 44765), (57, 44804), (72, 45014), (76, 45095), (80, 45131),

Gene: HUHilltop\_65 Start: 39911, Stop: 40909, Start Num: 13

Candidate Starts for HUHilltop\_65:

(Start: 13 @39911 has 41 MA's), (18, 39956), (37, 40106), (50, 40277), (55, 40310), (61, 40397), (62, 40406), (70, 40538), (75, 40613), (79, 40640), (91, 40898),

Gene: Huffy\_53 Start: 33407, Stop: 34255, Start Num: 16

Candidate Starts for Huffy\_53:

(Start: 13 @33380 has 41 MA's), (Start: 16 @33407 has 2 MA's), (22, 33467), (24, 33476), (26, 33503), (28, 33518), (30, 33530), (33, 33542), (49, 33689), (64, 33881), (77, 34058), (81, 34088), (86, 34223),

Gene: Huphlepuuff\_77 Start: 41565, Stop: 42491, Start Num: 15

Candidate Starts for Huphlepuuff\_77:

(Start: 14 @41562 has 1 MA's), (Start: 15 @41565 has 15 MA's), (36, 41745), (38, 41760), (39, 41763), (43, 41805), (46, 41823), (69, 42120), (74, 42195), (79, 42237), (84, 42330), (85, 42366), (89, 42480), (90, 42486),

Gene: JKSyngboy\_52 Start: 44983, Stop: 45873, Start Num: 13

Candidate Starts for JKSyngboy\_52:

(1, 44593), (Start: 13 @44983 has 41 MA's), (20, 45043), (23, 45064), (34, 45148), (35, 45154), (36, 45163), (38, 45178), (40, 45187), (42, 45214), (43, 45235), (52, 45358), (57, 45397), (72, 45607), (76, 45688), (80, 45724),

Gene: Jebeks\_63 Start: 39208, Stop: 40206, Start Num: 13

Candidate Starts for Jebeks\_63:

(Start: 13 @39208 has 41 MA's), (18, 39253), (37, 39403), (50, 39574), (55, 39607), (61, 39694), (62, 39703), (70, 39835), (75, 39910), (79, 39937), (91, 40195),

Gene: JoieB\_76 Start: 42016, Stop: 42954, Start Num: 15

Candidate Starts for JoieB\_76:

(Start: 14 @42013 has 1 MA's), (Start: 15 @42016 has 15 MA's), (36, 42196), (38, 42211), (39, 42214), (43, 42256), (46, 42274), (69, 42583), (74, 42658), (79, 42700), (84, 42793), (85, 42829), (89, 42943), (90, 42949),

Gene: Jung\_63 Start: 40211, Stop: 41209, Start Num: 13

Candidate Starts for Jung\_63:

(Start: 13 @40211 has 41 MA's), (18, 40256), (37, 40406), (50, 40577), (55, 40610), (61, 40697), (62, 40706), (70, 40838), (75, 40913), (79, 40940), (91, 41198),

Gene: Juniormint\_60 Start: 38664, Stop: 39662, Start Num: 13

Candidate Starts for Juniormint\_60:

(Start: 13 @38664 has 41 MA's), (18, 38709), (37, 38859), (50, 39030), (55, 39063), (61, 39150), (62, 39159), (70, 39291), (75, 39366), (79, 39393), (91, 39651),

Gene: Kroos\_54 Start: 44667, Stop: 45560, Start Num: 13

Candidate Starts for Kroos\_54:

(1, 44277), (Start: 13 @44667 has 41 MA's), (20, 44727), (23, 44748), (26, 44778), (34, 44832), (35, 44838), (36, 44847), (38, 44862), (40, 44871), (42, 44898), (43, 44919), (52, 45042), (57, 45081), (72, 45291), (76, 45372), (80, 45408),

Gene: Kwobi\_55 Start: 45093, Stop: 45986, Start Num: 13

Candidate Starts for Kwobi\_55:

(1, 44703), (Start: 13 @45093 has 41 MA's), (20, 45153), (23, 45174), (26, 45204), (34, 45258), (35, 45264), (36, 45273), (38, 45288), (40, 45297), (42, 45324), (43, 45345), (52, 45468), (57, 45507), (72, 45717), (76, 45798), (80, 45834),

Gene: Lilbit\_75 Start: 42110, Stop: 43051, Start Num: 14

Candidate Starts for Lilbit\_75:

(Start: 14 @42110 has 1 MA's), (Start: 15 @42113 has 15 MA's), (36, 42293), (38, 42308), (39, 42311), (43, 42353), (46, 42371), (69, 42680), (74, 42755), (79, 42797), (84, 42890), (85, 42926), (89, 43040), (90, 43046),

Gene: LittleLaf\_75 Start: 41839, Stop: 42780, Start Num: 14



Candidate Starts for LittleLaf\_75:

(Start: 14 @41839 has 1 MA's), (Start: 15 @41842 has 15 MA's), (36, 42022), (38, 42037), (39, 42040), (43, 42082), (46, 42100), (69, 42409), (74, 42484), (79, 42526), (84, 42619), (85, 42655), (89, 42769), (90, 42775),

Gene: Malithi\_62 Start: 39826, Stop: 40836, Start Num: 13

Candidate Starts for Malithi\_62:

(Start: 13 @39826 has 41 MA's), (18, 39871), (37, 40021), (50, 40192), (55, 40225), (61, 40312), (62, 40321), (70, 40465), (75, 40540), (79, 40567), (91, 40825),

Gene: Marvin\_71 Start: 41650, Stop: 42576, Start Num: 15

Candidate Starts for Marvin\_71:

(Start: 14 @41647 has 1 MA's), (Start: 15 @41650 has 15 MA's), (36, 41830), (38, 41845), (39, 41848), (43, 41890), (46, 41908), (69, 42205), (74, 42280), (79, 42322), (84, 42415), (85, 42451), (89, 42565), (90, 42571),

Gene: Megiddo\_62 Start: 41848, Stop: 42846, Start Num: 13

Candidate Starts for Megiddo\_62:

(Start: 13 @41848 has 41 MA's), (18, 41893), (37, 42043), (50, 42214), (55, 42247), (61, 42334), (62, 42343), (70, 42475), (75, 42550), (79, 42577), (87, 42760), (91, 42835),

Gene: MosMoris\_72 Start: 41533, Stop: 42471, Start Num: 15

Candidate Starts for MosMoris\_72:

(Start: 14 @41530 has 1 MA's), (Start: 15 @41533 has 15 MA's), (36, 41713), (38, 41728), (39, 41731), (43, 41773), (46, 41791), (69, 42100), (74, 42175), (79, 42217), (84, 42310), (85, 42346), (89, 42460), (90, 42466),

Gene: Necropolis\_60 Start: 39277, Stop: 40275, Start Num: 13

Candidate Starts for Necropolis\_60:

(Start: 13 @39277 has 41 MA's), (18, 39322), (37, 39472), (50, 39643), (55, 39676), (61, 39763), (62, 39772), (70, 39904), (75, 39979), (79, 40006), (91, 40264),

Gene: Phineas\_63 Start: 40246, Stop: 41244, Start Num: 13

Candidate Starts for Phineas\_63:

(Start: 13 @40246 has 41 MA's), (18, 40291), (37, 40441), (50, 40612), (55, 40645), (61, 40732), (62, 40741), (70, 40873), (75, 40948), (79, 40975), (91, 41233),

Gene: Poise\_76 Start: 41429, Stop: 42367, Start Num: 15

Candidate Starts for Poise\_76:

(Start: 14 @41426 has 1 MA's), (Start: 15 @41429 has 15 MA's), (36, 41609), (38, 41624), (39, 41627), (43, 41669), (46, 41687), (69, 41996), (74, 42071), (79, 42113), (84, 42206), (85, 42242), (89, 42356), (90, 42362),

Gene: Polkaroo\_64 Start: 41992, Stop: 42990, Start Num: 13

Candidate Starts for Polkaroo\_64:

(Start: 13 @41992 has 41 MA's), (18, 42037), (37, 42187), (50, 42358), (55, 42391), (61, 42478), (62, 42487), (70, 42619), (75, 42694), (79, 42721), (91, 42979),

Gene: Pringar\_73 Start: 41366, Stop: 42292, Start Num: 15

Candidate Starts for Pringar\_73:

(Start: 14 @41363 has 1 MA's), (Start: 15 @41366 has 15 MA's), (36, 41546), (38, 41561), (39, 41564), (43, 41606), (46, 41624), (69, 41921), (74, 41996), (79, 42038), (84, 42131), (85, 42167), (89, 42281), (90, 42287),

Gene: Pygmy\_66 Start: 41710, Stop: 42708, Start Num: 13

Candidate Starts for Pygmy\_66:

(Start: 13 @41710 has 41 MA's), (18, 41755), (37, 41905), (50, 42076), (55, 42109), (61, 42196), (62, 42205), (70, 42337), (75, 42412), (79, 42439), (91, 42697),

Gene: QueenHazel\_59 Start: 39831, Stop: 40829, Start Num: 13

Candidate Starts for QueenHazel\_59:

(Start: 13 @39831 has 41 MA's), (18, 39876), (37, 40026), (45, 40107), (50, 40197), (55, 40230), (58, 40269), (61, 40317), (62, 40326), (70, 40458), (75, 40536), (79, 40563), (81, 40584),

Gene: Raela\_76 Start: 41986, Stop: 42918, Start Num: 15

Candidate Starts for Raela\_76:

(Start: 14 @41983 has 1 MA's), (Start: 15 @41986 has 15 MA's), (36, 42166), (38, 42181), (39, 42184), (43, 42226), (46, 42244), (69, 42547), (74, 42622), (79, 42664), (84, 42757), (85, 42793), (89, 42907), (90, 42913),

Gene: RedRaider77\_75 Start: 41374, Stop: 42312, Start Num: 15

Candidate Starts for RedRaider77\_75:

(Start: 14 @41371 has 1 MA's), (Start: 15 @41374 has 15 MA's), (36, 41554), (38, 41569), (39, 41572), (43, 41614), (46, 41632), (69, 41941), (74, 42016), (79, 42058), (84, 42151), (85, 42187), (89, 42301), (90, 42307),

Gene: Ribeye\_54 Start: 45091, Stop: 45984, Start Num: 13

Candidate Starts for Ribeye\_54:

(1, 44701), (4, 44794), (Start: 13 @45091 has 41 MA's), (20, 45151), (23, 45172), (34, 45256), (35, 45262), (38, 45286), (40, 45295), (42, 45322), (43, 45343), (52, 45466), (57, 45505), (66, 45646), (72, 45715), (76, 45796), (80, 45832),

Gene: SPB78\_57 Start: 38788, Stop: 39564, Start Num: 13

Candidate Starts for SPB78\_57:

(Start: 13 @38788 has 41 MA's), (23, 38869), (25, 38887), (26, 38899), (27, 38914), (31, 38935), (36, 38965), (44, 39049), (48, 39088), (63, 39280), (67, 39349), (68, 39364), (76, 39475), (78, 39490),

Gene: Saronaya\_54 Start: 44390, Stop: 45280, Start Num: 13

Candidate Starts for Saronaya\_54:

(1, 44000), (4, 44093), (Start: 13 @44390 has 41 MA's), (20, 44450), (23, 44471), (34, 44555), (35, 44561), (38, 44585), (40, 44594), (42, 44621), (43, 44642), (52, 44765), (57, 44804), (72, 45014), (76, 45095), (80, 45131),

Gene: Schmidt\_46 Start: 30686, Stop: 31453, Start Num: 13

Candidate Starts for Schmidt\_46:

(Start: 13 @30686 has 41 MA's), (19, 30734), (28, 30824), (30, 30836), (37, 30881), (41, 30905), (59, 31073), (81, 31283), (82, 31313), (88, 31448),

Gene: SchottB\_52 Start: 44927, Stop: 45820, Start Num: 13

Candidate Starts for SchottB\_52:

(1, 44537), (Start: 13 @44927 has 41 MA's), (20, 44987), (23, 45008), (26, 45038), (34, 45092), (35, 45098), (36, 45107), (38, 45122), (40, 45131), (42, 45158), (43, 45179), (52, 45302), (57, 45341), (72, 45551), (76, 45632), (80, 45668),

Gene: Shipwreck\_65 Start: 41685, Stop: 42683, Start Num: 13

Candidate Starts for Shipwreck\_65:

(Start: 13 @41685 has 41 MA's), (18, 41730), (37, 41880), (50, 42051), (55, 42084), (61, 42171), (62, 42180), (70, 42312), (75, 42387), (79, 42414), (91, 42672),

Gene: Shoya\_60 Start: 34184, Stop: 34990, Start Num: 13

Candidate Starts for Shoya\_60:

(Start: 13 @34184 has 41 MA's), (22, 34271), (30, 34334), (37, 34379), (49, 34493), (53, 34556), (65, 34706), (82, 34907),

Gene: Sonah\_63 Start: 39382, Stop: 40380, Start Num: 13

Candidate Starts for Sonah\_63:

(Start: 13 @39382 has 41 MA's), (18, 39427), (37, 39577), (50, 39748), (55, 39781), (61, 39868), (62, 39877), (70, 40009), (75, 40084), (79, 40111), (91, 40369),

Gene: StevieRay\_67 Start: 42449, Stop: 43447, Start Num: 13

Candidate Starts for StevieRay\_67:

(Start: 13 @42449 has 41 MA's), (18, 42494), (37, 42644), (50, 42815), (55, 42848), (61, 42935), (62, 42944), (70, 43076), (75, 43151), (79, 43178), (91, 43436),

Gene: Tangerine\_53 Start: 43802, Stop: 44692, Start Num: 13

Candidate Starts for Tangerine\_53:

(1, 43412), (4, 43505), (Start: 13 @43802 has 41 MA's), (20, 43862), (23, 43883), (34, 43967), (35, 43973), (38, 43997), (40, 44006), (42, 44033), (43, 44054), (52, 44177), (57, 44216), (72, 44426), (76, 44507), (80, 44543),

Gene: Techage\_63 Start: 40250, Stop: 41245, Start Num: 13

Candidate Starts for Techage\_63:

(Start: 13 @40250 has 41 MA's), (18, 40295), (37, 40445), (45, 40526), (47, 40529), (50, 40616), (55, 40649), (58, 40688), (61, 40736), (62, 40745), (70, 40877), (75, 40952), (79, 40979), (81, 41000),

Gene: Tesla\_72 Start: 41223, Stop: 42161, Start Num: 15

Candidate Starts for Tesla\_72:

(Start: 14 @41220 has 1 MA's), (Start: 15 @41223 has 15 MA's), (36, 41403), (38, 41418), (39, 41421), (43, 41463), (46, 41481), (69, 41790), (74, 41865), (79, 41907), (84, 42000), (85, 42036), (89, 42150), (90, 42156),

Gene: Thespis\_64 Start: 41215, Stop: 42213, Start Num: 13

Candidate Starts for Thespis\_64:

(Start: 13 @41215 has 41 MA's), (18, 41260), (37, 41410), (50, 41581), (55, 41614), (61, 41701), (62, 41710), (70, 41842), (75, 41917), (79, 41944), (91, 42202),

Gene: VWB\_49 Start: 36944, Stop: 37702, Start Num: 13

Candidate Starts for VWB\_49:

(3, 36617), (6, 36746), (7, 36749), (8, 36785), (9, 36815), (Start: 13 @36944 has 41 MA's), (20, 37004), (27, 37070), (29, 37082), (31, 37091), (44, 37202), (71, 37529),

Gene: VasuNzinga\_74 Start: 41324, Stop: 42250, Start Num: 15

Candidate Starts for VasuNzinga\_74:

(Start: 14 @41321 has 1 MA's), (Start: 15 @41324 has 15 MA's), (36, 41504), (38, 41519), (39, 41522), (43, 41564), (46, 41582), (69, 41879), (74, 41954), (79, 41996), (84, 42089), (85, 42125), (89, 42239), (90, 42245),

Gene: Venti\_60 Start: 38622, Stop: 39617, Start Num: 13

Candidate Starts for Venti\_60:

(Start: 13 @38622 has 41 MA's), (18, 38667), (37, 38817), (45, 38898), (50, 38988), (55, 39021), (58, 39060), (61, 39108), (62, 39117), (70, 39249), (75, 39324), (79, 39351), (81, 39372),

Gene: Vidya\_61 Start: 39503, Stop: 40501, Start Num: 13

Candidate Starts for Vidya\_61:

(Start: 13 @39503 has 41 MA's), (18, 39548), (37, 39698), (50, 39869), (55, 39902), (61, 39989), (62, 39998), (70, 40130), (75, 40205), (79, 40232), (91, 40490),

Gene: Xula\_58 Start: 39452, Stop: 40450, Start Num: 13

Candidate Starts for Xula\_58:

(Start: 13 @39452 has 41 MA's), (18, 39497), (37, 39647), (45, 39728), (47, 39731), (50, 39818), (55, 39851), (58, 39890), (61, 39938), (62, 39947), (70, 40079), (75, 40157), (79, 40184), (81, 40205),

Gene: YorkOnyx\_55 Start: 44582, Stop: 45475, Start Num: 13

Candidate Starts for YorkOnyx\_55:

(1, 44192), (Start: 13 @44582 has 41 MA's), (20, 44642), (23, 44663), (26, 44693), (34, 44747), (35, 44753), (36, 44762), (38, 44777), (40, 44786), (42, 44813), (43, 44834), (52, 44957), (57, 44996), (72, 45206), (76, 45287), (80, 45323),

Gene: Zilizebeth\_68 Start: 41024, Stop: 42022, Start Num: 13

Candidate Starts for Zilizebeth\_68:

(Start: 13 @41024 has 41 MA's), (18, 41069), (37, 41219), (50, 41390), (55, 41423), (61, 41510), (62, 41519), (70, 41651), (75, 41726), (79, 41753), (91, 42011),

Gene: Zucker\_78 Start: 46620, Stop: 47435, Start Num: 13

Candidate Starts for Zucker\_78:

(10, 46542), (Start: 13 @46620 has 41 MA's), (21, 46689), (22, 46695), (37, 46803), (49, 46920), (65, 47166), (73, 47247), (82, 47367), (83, 47379),