



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 192525 Report

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

Pham number 192525 has 77 members, 4 are drafts.

Phages represented in each track:

- Track 1 : Cursive\_91, Leo04\_94, BlueOtter\_93, Watermoore\_92, Sushi23\_92, Cross\_93, Scheme\_94, HangryHippo\_93, Tribute\_91, Pepperwood\_93, Teutsch\_93, Larnav\_93
- Track 2 : PacManQ\_92, Lululemon\_92
- Track 3 : LilMartin\_91, MulchMansion\_91, Angela\_91
- Track 4 : Navo\_91
- Track 5 : Mildred21\_92
- Track 6 : EGole\_94
- Track 7 : NootNoot\_89, Bartholomune\_92, Liandry\_92, Persimmon\_92, Squillium\_93, PinkiePie\_92
- Track 8 : Evy\_93
- Track 9 : Braelyn\_94
- Track 10 : Bmoc\_92
- Track 11 : Daubenski\_95
- Track 12 : WhereRU\_90
- Track 13 : Samisti12\_93, Peebs\_92
- Track 14 : Warpy\_96, Jay2Jay\_97
- Track 15 : Anedea\_93
- Track 16 : Paradiddles\_89
- Track 17 : Targaryen\_93
- Track 18 : Enygma\_97
- Track 19 : PumpkinSpice\_96, Starbow\_95, Gibbi\_101, Quaran19\_96, Bordeaux\_95, Jollison\_96, IchabodCrane\_94, Amabiko\_97, JimJam\_97, SaltySpittoon\_96, Spelly\_97, Wipeout\_94, TomSawyer\_95, MindFlayer\_94, Battuta\_95, Birchlyn\_94
- Track 20 : Tomas\_98
- Track 21 : Wofford\_95
- Track 22 : BoomerJR\_97, Sollertia\_97, Yaboi\_97, Stanimal\_97, Genie2\_97
- Track 23 : Mugiwara\_99
- Track 24 : Spilled\_98, CeilingFan\_99, KentuckyRacer\_97, Karimac\_96
- Track 25 : Elmer\_98
- Track 26 : StarPlatinum\_97
- Track 27 : LukeCage\_96
- Track 28 : Weasels2\_111
- Track 29 : Peregrin\_109
- Track 30 : Grayson\_111
- Track 31 : NiceHouse\_99
- Track 32 : Trina\_112

- Track 33 : Dorin\_86, Francesca\_86

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

The start number called the most often in the published annotations is 9, it was called in 39 of the 73 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- Amabiko\_97, Anedea\_93, Angela\_91, Bartholomune\_92, Battuta\_95, Birchlyn\_94, Bmoc\_92, Bordeaux\_95, Braelyn\_94, CeilingFan\_99, Elmer\_98, Enygma\_97, Gibbi\_101, IchabodCrane\_94, JimJam\_97, Jollison\_96, Karimac\_96, KentuckyRacer\_97, Liandry\_92, LilMartin\_91, LukeCage\_96, Mildred21\_92, MindFlayer\_94, Mugiwara\_99, MulchMansion\_91, Navo\_91, NootNoot\_89, Persimmon\_92, PinkiePie\_92, PumpkinSpice\_96, Quaran19\_96, SaltySpittoon\_96, Spelly\_97, Spilled\_98, Squillium\_93, StarPlatinum\_97, Starbow\_95, TomSawyer\_95, Tomas\_98, WhereRU\_90, Wipeout\_94, Wofford\_95,

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

- Paradiddles\_89,

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

- BlueOtter\_93, BoomerJR\_97, Cross\_93, Cursive\_91, Daubenski\_95, Dorin\_86, EGole\_94, Evy\_93, Francesca\_86, Genie2\_97, Grayson\_111, HangryHippo\_93, Jay2Jay\_97, Larnav\_93, Leo04\_94, Lululemon\_92, NiceHouse\_99, PacManQ\_92, Peebs\_92, Pepperwood\_93, Peregrin\_109, Samisti12\_93, Scheme\_94, Sollertia\_97, Stanimal\_97, Sushi23\_92, Targaryen\_93, Teutsch\_93, Tribute\_91, Trina\_112, Warpy\_96, Watermoore\_92, Weasels2\_111, Yaboi\_97,

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

Start 5:

- Found in 22 of 77 ( 28.6% ) of genes in pham
- Manual Annotations of this start: 13 of 73
- Called 63.6% of time when present
- Phage (with cluster) where this start called: BlueOtter\_93 (BE1), Cross\_93 (BE1), Cursive\_91 (BE1), HangryHippo\_93 (BE1), Jay2Jay\_97 (BE1), Larnav\_93 (BE1), Leo04\_94 (BE1), Pepperwood\_93 (BE1), Scheme\_94 (BE1), Sushi23\_92 (BE1), Teutsch\_93 (BE1), Tribute\_91 (BE1), Warpy\_96 (BE1), Watermoore\_92 (BE1),

Start 7:

- Found in 5 of 77 ( 6.5% ) of genes in pham
- Manual Annotations of this start: 5 of 73
- Called 100.0% of time when present
- Phage (with cluster) where this start called: BoomerJR\_97 (BE2), Genie2\_97 (BE2), Sollertia\_97 (BE2), Stanimal\_97 (BE2), Yaboi\_97 (BE2),

Start 8:

- Found in 22 of 77 ( 28.6% ) of genes in pham
- Manual Annotations of this start: 3 of 73
- Called 13.6% of time when present

- Phage (with cluster) where this start called: Daubenski\_95 (BE1), EGole\_94 (BE1), Targaryen\_93 (BE1),

#### Start 9:

- Found in 43 of 77 ( 55.8% ) of genes in pham
- Manual Annotations of this start: 39 of 73
- Called 97.7% of time when present
- Phage (with cluster) where this start called: Amabiko\_97 (BE2), Anedea\_93 (BE1), Angela\_91 (BE1), Bartholomune\_92 (BE1), Battuta\_95 (BE2), Birchlyn\_94 (BE2), Bmoc\_92 (BE1), Bordeaux\_95 (BE2), Braelyn\_94 (BE1), CeilingFan\_99 (BE2), Elmer\_98 (BE2), Enygma\_97 (BE2), Gibbi\_101 (BE2), IchabodCrane\_94 (BE2), JimJam\_97 (BE2), Jollison\_96 (BE2), Karimac\_96 (BE2), KentuckyRacer\_97 (BE2), Liandry\_92 (BE1), LilMartin\_91 (BE1), LukeCage\_96 (BE2), Mildred21\_92 (BE1), MindFlayer\_94 (BE2), Mugiwara\_99 (BE2), MulchMansion\_91 (BE1), Navo\_91 (BE1), NootNoot\_89 (BE1), Persimmon\_92 (BE1), PinkiePie\_92 (BE1), PumpkinSpice\_96 (BE2), Quaran19\_96 (BE2), SaltySpittoon\_96 (BE2), Spelly\_97 (BE2), Spilled\_98 (BE2), Squillium\_93 (BE1), StarPlatinum\_97 (BE2), Starbow\_95 (BE2), TomSawyer\_95 (BE2), Tomas\_98 (BE2), WhereRU\_90 (BE1), Wipeout\_94 (BE2), Wofford\_95 (BE2),

#### Start 10:

- Found in 22 of 77 ( 28.6% ) of genes in pham
- Manual Annotations of this start: 2 of 73
- Called 9.1% of time when present
- Phage (with cluster) where this start called: Lululemon\_92 (BE1), PacManQ\_92 (BE1),

#### Start 15:

- Found in 6 of 77 ( 7.8% ) of genes in pham
- Manual Annotations of this start: 6 of 73
- Called 100.0% of time when present
- Phage (with cluster) where this start called: Dorin\_86 (CG), Francesca\_86 (CG), Grayson\_111 (CB), Peregrin\_109 (CB), Trina\_112 (CE), Weasels2\_111 (CB),

#### Start 16:

- Found in 1 of 77 ( 1.3% ) of genes in pham
- Manual Annotations of this start: 1 of 73
- Called 100.0% of time when present
- Phage (with cluster) where this start called: NiceHouse\_99 (CE),

#### Start 17:

- Found in 70 of 77 ( 90.9% ) of genes in pham
- Manual Annotations of this start: 4 of 73
- Called 5.7% of time when present
- Phage (with cluster) where this start called: Evy\_93 (BE1), Paradiddles\_89 (BE1), Peebs\_92 (BE1), Samisti12\_93 (BE1),

### Summary by clusters:

There are 5 clusters represented in this pham: BE2, CB, BE1, CG, CE,

Info for manual annotations of cluster BE1:

- Start number 5 was manually annotated 13 times for cluster BE1.

- Start number 8 was manually annotated 3 times for cluster BE1.
- Start number 9 was manually annotated 15 times for cluster BE1.
- Start number 10 was manually annotated 2 times for cluster BE1.
- Start number 17 was manually annotated 4 times for cluster BE1.

Info for manual annotations of cluster BE2:

- Start number 7 was manually annotated 5 times for cluster BE2.
- Start number 9 was manually annotated 24 times for cluster BE2.

Info for manual annotations of cluster CB:

- Start number 15 was manually annotated 3 times for cluster CB.

Info for manual annotations of cluster CE:

- Start number 15 was manually annotated 1 time for cluster CE.
- Start number 16 was manually annotated 1 time for cluster CE.

Info for manual annotations of cluster CG:

- Start number 15 was manually annotated 2 times for cluster CG.

### **Gene Information:**

Gene: Amabiko\_97 Start: 67717, Stop: 68340, Start Num: 9

Candidate Starts for Amabiko\_97:

(Start: 9 @67717 has 39 MA's), (13, 67732), (Start: 17 @67765 has 4 MA's), (18, 67777), (31, 67906), (34, 67927), (48, 68065), (49, 68074), (50, 68080), (52, 68113), (60, 68185), (63, 68203),

Gene: Anedea\_93 Start: 66994, Stop: 67614, Start Num: 9

Candidate Starts for Anedea\_93:

(Start: 9 @66994 has 39 MA's), (13, 67009), (14, 67012), (Start: 17 @67042 has 4 MA's), (18, 67054), (22, 67087), (34, 67204), (36, 67225), (37, 67240), (41, 67282), (49, 67351), (50, 67357), (63, 67480), (64, 67483), (71, 67525), (73, 67531), (79, 67588), (80, 67606),

Gene: Angela\_91 Start: 66466, Stop: 67086, Start Num: 9

Candidate Starts for Angela\_91:

(Start: 9 @66466 has 39 MA's), (13, 66481), (14, 66484), (Start: 17 @66514 has 4 MA's), (18, 66526), (34, 66676), (37, 66712), (41, 66754), (49, 66823), (50, 66829), (51, 66844), (69, 66985), (71, 66997), (75, 67024), (79, 67060), (80, 67078),

Gene: Bartholomune\_92 Start: 66893, Stop: 67513, Start Num: 9

Candidate Starts for Bartholomune\_92:

(Start: 9 @66893 has 39 MA's), (13, 66908), (14, 66911), (Start: 17 @66941 has 4 MA's), (18, 66953), (29, 67076), (31, 67082), (38, 67157), (41, 67181), (42, 67199), (45, 67229), (48, 67241), (49, 67250), (50, 67256), (54, 67304), (73, 67430), (75, 67451), (79, 67487), (80, 67505),

Gene: Battuta\_95 Start: 67691, Stop: 68314, Start Num: 9

Candidate Starts for Battuta\_95:

(Start: 9 @67691 has 39 MA's), (13, 67706), (Start: 17 @67739 has 4 MA's), (18, 67751), (31, 67880), (34, 67901), (48, 68039), (49, 68048), (50, 68054), (52, 68087), (60, 68159), (63, 68177),

Gene: Birchlyn\_94 Start: 65574, Stop: 66197, Start Num: 9

Candidate Starts for Birchlyn\_94:

(Start: 9 @65574 has 39 MA's), (13, 65589), (Start: 17 @65622 has 4 MA's), (18, 65634), (31, 65763), (34, 65784), (48, 65922), (49, 65931), (50, 65937), (52, 65970), (60, 66042), (63, 66060),

Gene: BlueOtter\_93 Start: 67496, Stop: 68125, Start Num: 5

Candidate Starts for BlueOtter\_93:

(3, 67484), (Start: 5 @67496 has 13 MA's), (Start: 8 @67508 has 3 MA's), (Start: 10 @67511 has 2 MA's), (13, 67523), (14, 67526), (Start: 17 @67556 has 4 MA's), (18, 67568), (20, 67589), (31, 67694), (36, 67736), (41, 67793), (49, 67862), (50, 67868), (54, 67916), (63, 67991), (64, 67994), (69, 68024), (71, 68036), (73, 68042), (79, 68099), (80, 68117),

Gene: Bmoc\_92 Start: 66832, Stop: 67452, Start Num: 9

Candidate Starts for Bmoc\_92:

(Start: 9 @66832 has 39 MA's), (13, 66847), (14, 66850), (Start: 17 @66880 has 4 MA's), (18, 66892), (34, 67042), (36, 67063), (41, 67120), (42, 67138), (49, 67189), (50, 67195), (54, 67243), (63, 67318), (64, 67321), (71, 67363), (73, 67369), (79, 67426), (80, 67444),

Gene: BoomerJR\_97 Start: 67552, Stop: 68169, Start Num: 7

Candidate Starts for BoomerJR\_97:

(4, 67540), (Start: 7 @67552 has 5 MA's), (13, 67567), (Start: 17 @67600 has 4 MA's), (18, 67612), (31, 67741), (44, 67879), (49, 67909), (50, 67915), (53, 67960), (55, 67975), (63, 68038), (73, 68089),

Gene: Bordeaux\_95 Start: 67846, Stop: 68469, Start Num: 9

Candidate Starts for Bordeaux\_95:

(Start: 9 @67846 has 39 MA's), (13, 67861), (Start: 17 @67894 has 4 MA's), (18, 67906), (31, 68035), (34, 68056), (48, 68194), (49, 68203), (50, 68209), (52, 68242), (60, 68314), (63, 68332),

Gene: Braelyn\_94 Start: 67657, Stop: 68277, Start Num: 9

Candidate Starts for Braelyn\_94:

(Start: 9 @67657 has 39 MA's), (13, 67672), (14, 67675), (Start: 17 @67705 has 4 MA's), (18, 67717), (29, 67840), (31, 67846), (41, 67945), (42, 67963), (45, 67993), (49, 68014), (50, 68020), (73, 68194), (75, 68215), (79, 68251), (80, 68269),

Gene: CeilingFan\_99 Start: 67606, Stop: 68229, Start Num: 9

Candidate Starts for CeilingFan\_99:

(Start: 9 @67606 has 39 MA's), (13, 67621), (Start: 17 @67654 has 4 MA's), (18, 67666), (31, 67795), (34, 67816), (48, 67954), (49, 67963), (50, 67969), (52, 68002), (60, 68074), (63, 68092),

Gene: Cross\_93 Start: 67497, Stop: 68126, Start Num: 5

Candidate Starts for Cross\_93:

(3, 67485), (Start: 5 @67497 has 13 MA's), (Start: 8 @67509 has 3 MA's), (Start: 10 @67512 has 2 MA's), (13, 67524), (14, 67527), (Start: 17 @67557 has 4 MA's), (18, 67569), (20, 67590), (31, 67695), (36, 67737), (41, 67794), (49, 67863), (50, 67869), (54, 67917), (63, 67992), (64, 67995), (69, 68025), (71, 68037), (73, 68043), (79, 68100), (80, 68118),

Gene: Cursive\_91 Start: 67022, Stop: 67651, Start Num: 5

Candidate Starts for Cursive\_91:

(3, 67010), (Start: 5 @67022 has 13 MA's), (Start: 8 @67034 has 3 MA's), (Start: 10 @67037 has 2 MA's), (13, 67049), (14, 67052), (Start: 17 @67082 has 4 MA's), (18, 67094), (20, 67115), (31, 67220), (36, 67262), (41, 67319), (49, 67388), (50, 67394), (54, 67442), (63, 67517), (64, 67520), (69, 67550), (71, 67562), (73, 67568), (79, 67625), (80, 67643),

Gene: Daubenski\_95 Start: 67210, Stop: 67827, Start Num: 8

Candidate Starts for Daubenski\_95:

(Start: 5 @67198 has 13 MA's), (Start: 8 @67210 has 3 MA's), (Start: 10 @67213 has 2 MA's), (13, 67225), (14, 67228), (Start: 17 @67258 has 4 MA's), (18, 67270), (31, 67396), (32, 67399), (36, 67438), (41, 67495), (42, 67513), (45, 67543), (47, 67549), (49, 67564), (54, 67618), (55, 67630), (74, 67756), (79, 67801), (80, 67819),

Gene: Dorin\_86 Start: 67896, Stop: 68411, Start Num: 15

Candidate Starts for Dorin\_86:

(Start: 15 @67896 has 6 MA's), (24, 67974), (26, 68016), (28, 68043), (33, 68058), (40, 68115), (59, 68280), (78, 68382),

Gene: EGole\_94 Start: 68454, Stop: 69071, Start Num: 8

Candidate Starts for EGole\_94:

(3, 68430), (Start: 5 @68442 has 13 MA's), (Start: 8 @68454 has 3 MA's), (Start: 10 @68457 has 2 MA's), (13, 68469), (14, 68472), (Start: 17 @68502 has 4 MA's), (18, 68514), (20, 68535), (31, 68640), (36, 68682), (41, 68739), (49, 68808), (50, 68814), (54, 68862), (63, 68937), (64, 68940), (71, 68982), (73, 68988), (79, 69045), (80, 69063),

Gene: Elmer\_98 Start: 68014, Stop: 68634, Start Num: 9

Candidate Starts for Elmer\_98:

(1, 67975), (2, 67984), (Start: 9 @68014 has 39 MA's), (13, 68029), (Start: 17 @68062 has 4 MA's), (18, 68074), (27, 68182), (31, 68203), (34, 68224), (49, 68371), (50, 68377),

Gene: Enygma\_97 Start: 69502, Stop: 70125, Start Num: 9

Candidate Starts for Enygma\_97:

(Start: 9 @69502 has 39 MA's), (13, 69517), (Start: 17 @69550 has 4 MA's), (18, 69562), (31, 69691), (34, 69712), (48, 69850), (49, 69859), (50, 69865), (53, 69910), (55, 69925), (63, 69988),

Gene: Evy\_93 Start: 67457, Stop: 68026, Start Num: 17

Candidate Starts for Evy\_93:

(Start: 5 @67397 has 13 MA's), (Start: 8 @67409 has 3 MA's), (Start: 10 @67412 has 2 MA's), (13, 67424), (14, 67427), (Start: 17 @67457 has 4 MA's), (18, 67469), (28, 67586), (31, 67595), (32, 67598), (36, 67637), (41, 67694), (47, 67748), (49, 67763), (54, 67817), (74, 67955), (79, 68000), (80, 68018),

Gene: Francesca\_86 Start: 68634, Stop: 69149, Start Num: 15

Candidate Starts for Francesca\_86:

(Start: 15 @68634 has 6 MA's), (24, 68712), (26, 68754), (28, 68781), (33, 68796), (40, 68853), (59, 69018), (78, 69120),

Gene: Genie2\_97 Start: 67666, Stop: 68283, Start Num: 7

Candidate Starts for Genie2\_97:

(4, 67654), (Start: 7 @67666 has 5 MA's), (13, 67681), (Start: 17 @67714 has 4 MA's), (18, 67726), (31, 67855), (44, 67993), (49, 68023), (50, 68029), (53, 68074), (55, 68089), (63, 68152), (73, 68203),

Gene: Gibbi\_101 Start: 67829, Stop: 68452, Start Num: 9

Candidate Starts for Gibbi\_101:

(Start: 9 @67829 has 39 MA's), (13, 67844), (Start: 17 @67877 has 4 MA's), (18, 67889), (31, 68018), (34, 68039), (48, 68177), (49, 68186), (50, 68192), (52, 68225), (60, 68297), (63, 68315),

Gene: Grayson\_111 Start: 69624, Stop: 70139, Start Num: 15

Candidate Starts for Grayson\_111:

(Start: 15 @69624 has 6 MA's), (26, 69744), (56, 70011), (57, 70017), (59, 70026), (61, 70032), (72, 70095),

Gene: HangryHippo\_93 Start: 67496, Stop: 68125, Start Num: 5

Candidate Starts for HangryHippo\_93:

(3, 67484), (Start: 5 @67496 has 13 MA's), (Start: 8 @67508 has 3 MA's), (Start: 10 @67511 has 2 MA's), (13, 67523), (14, 67526), (Start: 17 @67556 has 4 MA's), (18, 67568), (20, 67589), (31, 67694), (36, 67736), (41, 67793), (49, 67862), (50, 67868), (54, 67916), (63, 67991), (64, 67994), (69, 68024), (71, 68036), (73, 68042), (79, 68099), (80, 68117),

Gene: IchabodCrane\_94 Start: 67418, Stop: 68041, Start Num: 9

Candidate Starts for IchabodCrane\_94:

(Start: 9 @67418 has 39 MA's), (13, 67433), (Start: 17 @67466 has 4 MA's), (18, 67478), (31, 67607), (34, 67628), (48, 67766), (49, 67775), (50, 67781), (52, 67814), (60, 67886), (63, 67904),

Gene: Jay2Jay\_97 Start: 68249, Stop: 68878, Start Num: 5

Candidate Starts for Jay2Jay\_97:

(Start: 5 @68249 has 13 MA's), (Start: 8 @68261 has 3 MA's), (Start: 10 @68264 has 2 MA's), (13, 68276), (14, 68279), (Start: 17 @68309 has 4 MA's), (18, 68321), (28, 68438), (31, 68447), (32, 68450), (36, 68489), (41, 68546), (47, 68600), (49, 68615), (54, 68669), (74, 68807), (79, 68852), (80, 68870),

Gene: JimJam\_97 Start: 67792, Stop: 68415, Start Num: 9

Candidate Starts for JimJam\_97:

(Start: 9 @67792 has 39 MA's), (13, 67807), (Start: 17 @67840 has 4 MA's), (18, 67852), (31, 67981), (34, 68002), (48, 68140), (49, 68149), (50, 68155), (52, 68188), (60, 68260), (63, 68278),

Gene: Jollison\_96 Start: 67674, Stop: 68297, Start Num: 9

Candidate Starts for Jollison\_96:

(Start: 9 @67674 has 39 MA's), (13, 67689), (Start: 17 @67722 has 4 MA's), (18, 67734), (31, 67863), (34, 67884), (48, 68022), (49, 68031), (50, 68037), (52, 68070), (60, 68142), (63, 68160),

Gene: Karimac\_96 Start: 67823, Stop: 68446, Start Num: 9

Candidate Starts for Karimac\_96:

(Start: 9 @67823 has 39 MA's), (13, 67838), (Start: 17 @67871 has 4 MA's), (18, 67883), (31, 68012), (34, 68033), (48, 68171), (49, 68180), (50, 68186), (52, 68219), (60, 68291), (63, 68309),

Gene: KentuckyRacer\_97 Start: 67607, Stop: 68230, Start Num: 9

Candidate Starts for KentuckyRacer\_97:

(Start: 9 @67607 has 39 MA's), (13, 67622), (Start: 17 @67655 has 4 MA's), (18, 67667), (31, 67796), (34, 67817), (48, 67955), (49, 67964), (50, 67970), (52, 68003), (60, 68075), (63, 68093),

Gene: Larnav\_93 Start: 67481, Stop: 68110, Start Num: 5

Candidate Starts for Larnav\_93:

(3, 67469), (Start: 5 @67481 has 13 MA's), (Start: 8 @67493 has 3 MA's), (Start: 10 @67496 has 2 MA's), (13, 67508), (14, 67511), (Start: 17 @67541 has 4 MA's), (18, 67553), (20, 67574), (31, 67679), (36, 67721), (41, 67778), (49, 67847), (50, 67853), (54, 67901), (63, 67976), (64, 67979), (69, 68009), (71, 68021), (73, 68027), (79, 68084), (80, 68102),

Gene: Leo04\_94 Start: 67996, Stop: 68625, Start Num: 5

Candidate Starts for Leo04\_94:

(3, 67984), (Start: 5 @67996 has 13 MA's), (Start: 8 @68008 has 3 MA's), (Start: 10 @68011 has 2 MA's), (13, 68023), (14, 68026), (Start: 17 @68056 has 4 MA's), (18, 68068), (20, 68089), (31, 68194), (36, 68236), (41, 68293), (49, 68362), (50, 68368), (54, 68416), (63, 68491), (64, 68494), (69, 68524), (71, 68536), (73, 68542), (79, 68599), (80, 68617),



Gene: Liandry\_92 Start: 67642, Stop: 68262, Start Num: 9

Candidate Starts for Liandry\_92:

(Start: 9 @67642 has 39 MA's), (13, 67657), (14, 67660), (Start: 17 @67690 has 4 MA's), (18, 67702), (29, 67825), (31, 67831), (38, 67906), (41, 67930), (42, 67948), (45, 67978), (48, 67990), (49, 67999), (50, 68005), (54, 68053), (73, 68179), (75, 68200), (79, 68236), (80, 68254),

Gene: LilMartin\_91 Start: 66414, Stop: 67034, Start Num: 9

Candidate Starts for LilMartin\_91:

(Start: 9 @66414 has 39 MA's), (13, 66429), (14, 66432), (Start: 17 @66462 has 4 MA's), (18, 66474), (34, 66624), (37, 66660), (41, 66702), (49, 66771), (50, 66777), (51, 66792), (69, 66933), (71, 66945), (75, 66972), (79, 67008), (80, 67026),

Gene: LukeCage\_96 Start: 67580, Stop: 68203, Start Num: 9

Candidate Starts for LukeCage\_96:

(Start: 9 @67580 has 39 MA's), (13, 67595), (Start: 17 @67628 has 4 MA's), (18, 67640), (31, 67769), (32, 67772), (34, 67790), (45, 67916), (49, 67937), (50, 67943), (52, 67976), (55, 68003), (63, 68066),

Gene: Lululemon\_92 Start: 66892, Stop: 67506, Start Num: 10

Candidate Starts for Lululemon\_92:

(3, 66865), (Start: 5 @66877 has 13 MA's), (Start: 8 @66889 has 3 MA's), (Start: 10 @66892 has 2 MA's), (13, 66904), (14, 66907), (Start: 17 @66937 has 4 MA's), (18, 66949), (20, 66970), (31, 67075), (36, 67117), (41, 67174), (49, 67243), (50, 67249), (54, 67297), (63, 67372), (64, 67375), (69, 67405), (71, 67417), (73, 67423), (79, 67480), (80, 67498),

Gene: Mildred21\_92 Start: 66640, Stop: 67260, Start Num: 9

Candidate Starts for Mildred21\_92:

(Start: 9 @66640 has 39 MA's), (13, 66655), (14, 66658), (Start: 17 @66688 has 4 MA's), (18, 66700), (29, 66823), (41, 66928), (49, 66997), (50, 67003), (67, 67144), (71, 67171), (79, 67234), (80, 67252),

Gene: MindFlayer\_94 Start: 67325, Stop: 67948, Start Num: 9

Candidate Starts for MindFlayer\_94:

(Start: 9 @67325 has 39 MA's), (13, 67340), (Start: 17 @67373 has 4 MA's), (18, 67385), (31, 67514), (34, 67535), (48, 67673), (49, 67682), (50, 67688), (52, 67721), (60, 67793), (63, 67811),

Gene: Mugiwara\_99 Start: 68079, Stop: 68702, Start Num: 9

Candidate Starts for Mugiwara\_99:

(Start: 9 @68079 has 39 MA's), (13, 68094), (Start: 17 @68127 has 4 MA's), (18, 68139), (31, 68268), (34, 68289), (43, 68403), (49, 68436), (50, 68442), (53, 68487), (63, 68565), (79, 68673),

Gene: MulchMansion\_91 Start: 66414, Stop: 67034, Start Num: 9

Candidate Starts for MulchMansion\_91:

(Start: 9 @66414 has 39 MA's), (13, 66429), (14, 66432), (Start: 17 @66462 has 4 MA's), (18, 66474), (34, 66624), (37, 66660), (41, 66702), (49, 66771), (50, 66777), (51, 66792), (69, 66933), (71, 66945), (75, 66972), (79, 67008), (80, 67026),

Gene: Navo\_91 Start: 67561, Stop: 68181, Start Num: 9

Candidate Starts for Navo\_91:

(Start: 9 @67561 has 39 MA's), (13, 67576), (14, 67579), (Start: 17 @67609 has 4 MA's), (18, 67621), (29, 67744), (31, 67750), (38, 67825), (41, 67849), (42, 67867), (45, 67897), (48, 67909), (49, 67918), (50, 67924), (54, 67972), (75, 68119), (79, 68155), (80, 68173),

Gene: NiceHouse\_99 Start: 72452, Stop: 72979, Start Num: 16

Candidate Starts for NiceHouse\_99:

(Start: 16 @72452 has 1 MA's), (21, 72506), (24, 72527), (25, 72533), (32, 72608), (34, 72617), (35, 72623), (46, 72719), (58, 72839), (62, 72857), (66, 72872), (68, 72887), (74, 72926), (77, 72944),

Gene: NootNoot\_89 Start: 66556, Stop: 67176, Start Num: 9

Candidate Starts for NootNoot\_89:

(Start: 9 @66556 has 39 MA's), (13, 66571), (14, 66574), (Start: 17 @66604 has 4 MA's), (18, 66616), (29, 66739), (31, 66745), (38, 66820), (41, 66844), (42, 66862), (45, 66892), (48, 66904), (49, 66913), (50, 66919), (54, 66967), (73, 67093), (75, 67114), (79, 67150), (80, 67168),

Gene: PacManQ\_92 Start: 66892, Stop: 67506, Start Num: 10

Candidate Starts for PacManQ\_92:

(3, 66865), (Start: 5 @66877 has 13 MA's), (Start: 8 @66889 has 3 MA's), (Start: 10 @66892 has 2 MA's), (13, 66904), (14, 66907), (Start: 17 @66937 has 4 MA's), (18, 66949), (20, 66970), (31, 67075), (36, 67117), (41, 67174), (49, 67243), (50, 67249), (54, 67297), (63, 67372), (64, 67375), (69, 67405), (71, 67417), (73, 67423), (79, 67480), (80, 67498),

Gene: Paradiddles\_89 Start: 66868, Stop: 67440, Start Num: 17

Candidate Starts for Paradiddles\_89:

(Start: 9 @66820 has 39 MA's), (13, 66835), (14, 66838), (Start: 17 @66868 has 4 MA's), (18, 66880), (29, 67003), (31, 67009), (41, 67108), (42, 67126), (45, 67156), (48, 67168), (49, 67177), (50, 67183), (54, 67231), (73, 67357), (75, 67378), (79, 67414), (80, 67432),

Gene: Peebs\_92 Start: 67291, Stop: 67860, Start Num: 17

Candidate Starts for Peebs\_92:

(3, 67219), (Start: 5 @67231 has 13 MA's), (Start: 8 @67243 has 3 MA's), (Start: 10 @67246 has 2 MA's), (13, 67258), (14, 67261), (Start: 17 @67291 has 4 MA's), (18, 67303), (20, 67324), (31, 67429), (36, 67471), (41, 67528), (49, 67597), (50, 67603), (54, 67651), (63, 67726), (64, 67729), (69, 67759), (71, 67771), (73, 67777), (79, 67834), (80, 67852),

Gene: Pepperwood\_93 Start: 67364, Stop: 67993, Start Num: 5

Candidate Starts for Pepperwood\_93:

(3, 67352), (Start: 5 @67364 has 13 MA's), (Start: 8 @67376 has 3 MA's), (Start: 10 @67379 has 2 MA's), (13, 67391), (14, 67394), (Start: 17 @67424 has 4 MA's), (18, 67436), (20, 67457), (31, 67562), (36, 67604), (41, 67661), (49, 67730), (50, 67736), (54, 67784), (63, 67859), (64, 67862), (69, 67892), (71, 67904), (73, 67910), (79, 67967), (80, 67985),

Gene: Peregrin\_109 Start: 68049, Stop: 68549, Start Num: 15

Candidate Starts for Peregrin\_109:

(Start: 15 @68049 has 6 MA's), (24, 68127), (26, 68169), (39, 68265), (56, 68421), (57, 68427), (59, 68436), (61, 68442), (63, 68457), (72, 68505),

Gene: Persimmon\_92 Start: 66489, Stop: 67109, Start Num: 9

Candidate Starts for Persimmon\_92:

(Start: 9 @66489 has 39 MA's), (13, 66504), (14, 66507), (Start: 17 @66537 has 4 MA's), (18, 66549), (29, 66672), (31, 66678), (38, 66753), (41, 66777), (42, 66795), (45, 66825), (48, 66837), (49, 66846), (50, 66852), (54, 66900), (73, 67026), (75, 67047), (79, 67083), (80, 67101),

Gene: PinkiePie\_92 Start: 67642, Stop: 68262, Start Num: 9

Candidate Starts for PinkiePie\_92:

(Start: 9 @67642 has 39 MA's), (13, 67657), (14, 67660), (Start: 17 @67690 has 4 MA's), (18, 67702), (29, 67825), (31, 67831), (38, 67906), (41, 67930), (42, 67948), (45, 67978), (48, 67990), (49, 67999), (50, 68005), (54, 68053), (73, 68179), (75, 68200), (79, 68236), (80, 68254),

Gene: PumpkinSpice\_96 Start: 67717, Stop: 68340, Start Num: 9

Candidate Starts for PumpkinSpice\_96:

(Start: 9 @67717 has 39 MA's), (13, 67732), (Start: 17 @67765 has 4 MA's), (18, 67777), (31, 67906), (34, 67927), (48, 68065), (49, 68074), (50, 68080), (52, 68113), (60, 68185), (63, 68203),

Gene: Quaran19\_96 Start: 67708, Stop: 68331, Start Num: 9

Candidate Starts for Quaran19\_96:

(Start: 9 @67708 has 39 MA's), (13, 67723), (Start: 17 @67756 has 4 MA's), (18, 67768), (31, 67897), (34, 67918), (48, 68056), (49, 68065), (50, 68071), (52, 68104), (60, 68176), (63, 68194),

Gene: SaltySpittoon\_96 Start: 67717, Stop: 68340, Start Num: 9

Candidate Starts for SaltySpittoon\_96:

(Start: 9 @67717 has 39 MA's), (13, 67732), (Start: 17 @67765 has 4 MA's), (18, 67777), (31, 67906), (34, 67927), (48, 68065), (49, 68074), (50, 68080), (52, 68113), (60, 68185), (63, 68203),

Gene: Samisti12\_93 Start: 68733, Stop: 69302, Start Num: 17

Candidate Starts for Samisti12\_93:

(3, 68661), (Start: 5 @68673 has 13 MA's), (Start: 8 @68685 has 3 MA's), (Start: 10 @68688 has 2 MA's), (13, 68700), (14, 68703), (Start: 17 @68733 has 4 MA's), (18, 68745), (20, 68766), (31, 68871), (36, 68913), (41, 68970), (49, 69039), (50, 69045), (54, 69093), (63, 69168), (64, 69171), (69, 69201), (71, 69213), (73, 69219), (79, 69276), (80, 69294),

Gene: Scheme\_94 Start: 68078, Stop: 68707, Start Num: 5

Candidate Starts for Scheme\_94:

(3, 68066), (Start: 5 @68078 has 13 MA's), (Start: 8 @68090 has 3 MA's), (Start: 10 @68093 has 2 MA's), (13, 68105), (14, 68108), (Start: 17 @68138 has 4 MA's), (18, 68150), (20, 68171), (31, 68276), (36, 68318), (41, 68375), (49, 68444), (50, 68450), (54, 68498), (63, 68573), (64, 68576), (69, 68606), (71, 68618), (73, 68624), (79, 68681), (80, 68699),

Gene: Sollertia\_97 Start: 67666, Stop: 68283, Start Num: 7

Candidate Starts for Sollertia\_97:

(4, 67654), (Start: 7 @67666 has 5 MA's), (13, 67681), (Start: 17 @67714 has 4 MA's), (18, 67726), (31, 67855), (44, 67993), (49, 68023), (50, 68029), (53, 68074), (55, 68089), (63, 68152), (73, 68203),

Gene: Spelly\_97 Start: 67672, Stop: 68295, Start Num: 9

Candidate Starts for Spelly\_97:

(Start: 9 @67672 has 39 MA's), (13, 67687), (Start: 17 @67720 has 4 MA's), (18, 67732), (31, 67861), (34, 67882), (48, 68020), (49, 68029), (50, 68035), (52, 68068), (60, 68140), (63, 68158),

Gene: Spilled\_98 Start: 67789, Stop: 68412, Start Num: 9

Candidate Starts for Spilled\_98:

(Start: 9 @67789 has 39 MA's), (13, 67804), (Start: 17 @67837 has 4 MA's), (18, 67849), (31, 67978), (34, 67999), (48, 68137), (49, 68146), (50, 68152), (52, 68185), (60, 68257), (63, 68275),

Gene: Squillium\_93 Start: 67643, Stop: 68263, Start Num: 9

Candidate Starts for Squillium\_93:

(Start: 9 @67643 has 39 MA's), (13, 67658), (14, 67661), (Start: 17 @67691 has 4 MA's), (18, 67703), (29, 67826), (31, 67832), (38, 67907), (41, 67931), (42, 67949), (45, 67979), (48, 67991), (49, 68000), (50, 68006), (54, 68054), (73, 68180), (75, 68201), (79, 68237), (80, 68255),

Gene: Stanimal\_97 Start: 67555, Stop: 68172, Start Num: 7

Candidate Starts for Stanimal\_97:

(4, 67543), (Start: 7 @67555 has 5 MA's), (13, 67570), (Start: 17 @67603 has 4 MA's), (18, 67615), (31, 67744), (44, 67882), (49, 67912), (50, 67918), (53, 67963), (55, 67978), (63, 68041), (73, 68092),

Gene: StarPlatinum\_97 Start: 68225, Stop: 68848, Start Num: 9

Candidate Starts for StarPlatinum\_97:

(Start: 9 @68225 has 39 MA's), (13, 68240), (Start: 17 @68273 has 4 MA's), (18, 68285), (31, 68414), (32, 68417), (34, 68435), (45, 68561), (49, 68582), (50, 68588), (52, 68621), (55, 68648), (63, 68711), (75, 68783),

Gene: Starbow\_95 Start: 67693, Stop: 68316, Start Num: 9

Candidate Starts for Starbow\_95:

(Start: 9 @67693 has 39 MA's), (13, 67708), (Start: 17 @67741 has 4 MA's), (18, 67753), (31, 67882), (34, 67903), (48, 68041), (49, 68050), (50, 68056), (52, 68089), (60, 68161), (63, 68179),

Gene: Sushi23\_92 Start: 67589, Stop: 68218, Start Num: 5

Candidate Starts for Sushi23\_92:

(3, 67577), (Start: 5 @67589 has 13 MA's), (Start: 8 @67601 has 3 MA's), (Start: 10 @67604 has 2 MA's), (13, 67616), (14, 67619), (Start: 17 @67649 has 4 MA's), (18, 67661), (20, 67682), (31, 67787), (36, 67829), (41, 67886), (49, 67955), (50, 67961), (54, 68009), (63, 68084), (64, 68087), (69, 68117), (71, 68129), (73, 68135), (79, 68192), (80, 68210),

Gene: Targaryen\_93 Start: 68311, Stop: 68928, Start Num: 8

Candidate Starts for Targaryen\_93:

(Start: 5 @68299 has 13 MA's), (Start: 8 @68311 has 3 MA's), (Start: 10 @68314 has 2 MA's), (13, 68326), (14, 68329), (Start: 17 @68359 has 4 MA's), (18, 68371), (28, 68488), (31, 68497), (32, 68500), (36, 68539), (41, 68596), (47, 68650), (49, 68665), (54, 68719), (74, 68857), (79, 68902), (80, 68920),

Gene: Teutsch\_93 Start: 67852, Stop: 68481, Start Num: 5

Candidate Starts for Teutsch\_93:

(3, 67840), (Start: 5 @67852 has 13 MA's), (Start: 8 @67864 has 3 MA's), (Start: 10 @67867 has 2 MA's), (13, 67879), (14, 67882), (Start: 17 @67912 has 4 MA's), (18, 67924), (20, 67945), (31, 68050), (36, 68092), (41, 68149), (49, 68218), (50, 68224), (54, 68272), (63, 68347), (64, 68350), (69, 68380), (71, 68392), (73, 68398), (79, 68455), (80, 68473),

Gene: TomSawyer\_95 Start: 67308, Stop: 67931, Start Num: 9

Candidate Starts for TomSawyer\_95:

(Start: 9 @67308 has 39 MA's), (13, 67323), (Start: 17 @67356 has 4 MA's), (18, 67368), (31, 67497), (34, 67518), (48, 67656), (49, 67665), (50, 67671), (52, 67704), (60, 67776), (63, 67794),

Gene: Tomas\_98 Start: 69753, Stop: 70373, Start Num: 9

Candidate Starts for Tomas\_98:

(Start: 9 @69753 has 39 MA's), (13, 69768), (Start: 17 @69801 has 4 MA's), (18, 69813), (23, 69849), (27, 69921), (29, 69936), (31, 69942), (37, 69999), (43, 70077), (49, 70110), (50, 70116), (53, 70161), (55, 70176), (67, 70257), (69, 70272), (76, 70317), (80, 70365),

Gene: Tribute\_91 Start: 67058, Stop: 67687, Start Num: 5

Candidate Starts for Tribute\_91:

(3, 67046), (Start: 5 @67058 has 13 MA's), (Start: 8 @67070 has 3 MA's), (Start: 10 @67073 has 2 MA's), (13, 67085), (14, 67088), (Start: 17 @67118 has 4 MA's), (18, 67130), (20, 67151), (31, 67256), (36, 67298), (41, 67355), (49, 67424), (50, 67430), (54, 67478), (63, 67553), (64, 67556), (69, 67586), (71, 67598), (73, 67604), (79, 67661), (80, 67679),

Gene: Trina\_112 Start: 75643, Stop: 76164, Start Num: 15

Candidate Starts for Trina\_112:

(6, 75595), (11, 75619), (12, 75622), (13, 75625), (Start: 15 @75643 has 6 MA's), (19, 75691), (21, 75700), (40, 75862), (57, 76024), (62, 76048), (66, 76063),

Gene: Warpy\_96 Start: 67762, Stop: 68391, Start Num: 5

Candidate Starts for Warpy\_96:

(Start: 5 @67762 has 13 MA's), (Start: 8 @67774 has 3 MA's), (Start: 10 @67777 has 2 MA's), (13, 67789), (14, 67792), (Start: 17 @67822 has 4 MA's), (18, 67834), (28, 67951), (31, 67960), (32, 67963), (36, 68002), (41, 68059), (47, 68113), (49, 68128), (54, 68182), (74, 68320), (79, 68365), (80, 68383),

Gene: Watermoore\_92 Start: 68068, Stop: 68697, Start Num: 5

Candidate Starts for Watermoore\_92:

(3, 68056), (Start: 5 @68068 has 13 MA's), (Start: 8 @68080 has 3 MA's), (Start: 10 @68083 has 2 MA's), (13, 68095), (14, 68098), (Start: 17 @68128 has 4 MA's), (18, 68140), (20, 68161), (31, 68266), (36, 68308), (41, 68365), (49, 68434), (50, 68440), (54, 68488), (63, 68563), (64, 68566), (69, 68596), (71, 68608), (73, 68614), (79, 68671), (80, 68689),

Gene: Weasels2\_111 Start: 69055, Stop: 69564, Start Num: 15

Candidate Starts for Weasels2\_111:

(Start: 15 @69055 has 6 MA's), (26, 69175), (30, 69208), (39, 69271), (57, 69433), (65, 69469), (70, 69499),

Gene: WhereRU\_90 Start: 67077, Stop: 67697, Start Num: 9

Candidate Starts for WhereRU\_90:

(Start: 9 @67077 has 39 MA's), (13, 67092), (14, 67095), (Start: 17 @67125 has 4 MA's), (18, 67137), (29, 67260), (31, 67266), (41, 67365), (42, 67383), (45, 67413), (49, 67434), (50, 67440), (54, 67488), (73, 67614), (75, 67635), (79, 67671), (80, 67689),

Gene: Wipeout\_94 Start: 68059, Stop: 68682, Start Num: 9

Candidate Starts for Wipeout\_94:

(Start: 9 @68059 has 39 MA's), (13, 68074), (Start: 17 @68107 has 4 MA's), (18, 68119), (31, 68248), (34, 68269), (48, 68407), (49, 68416), (50, 68422), (52, 68455), (60, 68527), (63, 68545),

Gene: Wofford\_95 Start: 67977, Stop: 68597, Start Num: 9

Candidate Starts for Wofford\_95:

(1, 67938), (2, 67947), (Start: 9 @67977 has 39 MA's), (13, 67992), (Start: 17 @68025 has 4 MA's), (18, 68037), (23, 68073), (27, 68145), (31, 68166), (34, 68187), (49, 68334), (50, 68340),

Gene: Yaboi\_97 Start: 67643, Stop: 68260, Start Num: 7

Candidate Starts for Yaboi\_97:

(4, 67631), (Start: 7 @67643 has 5 MA's), (13, 67658), (Start: 17 @67691 has 4 MA's), (18, 67703), (31, 67832), (44, 67970), (49, 68000), (50, 68006), (53, 68051), (55, 68066), (63, 68129), (73, 68180),