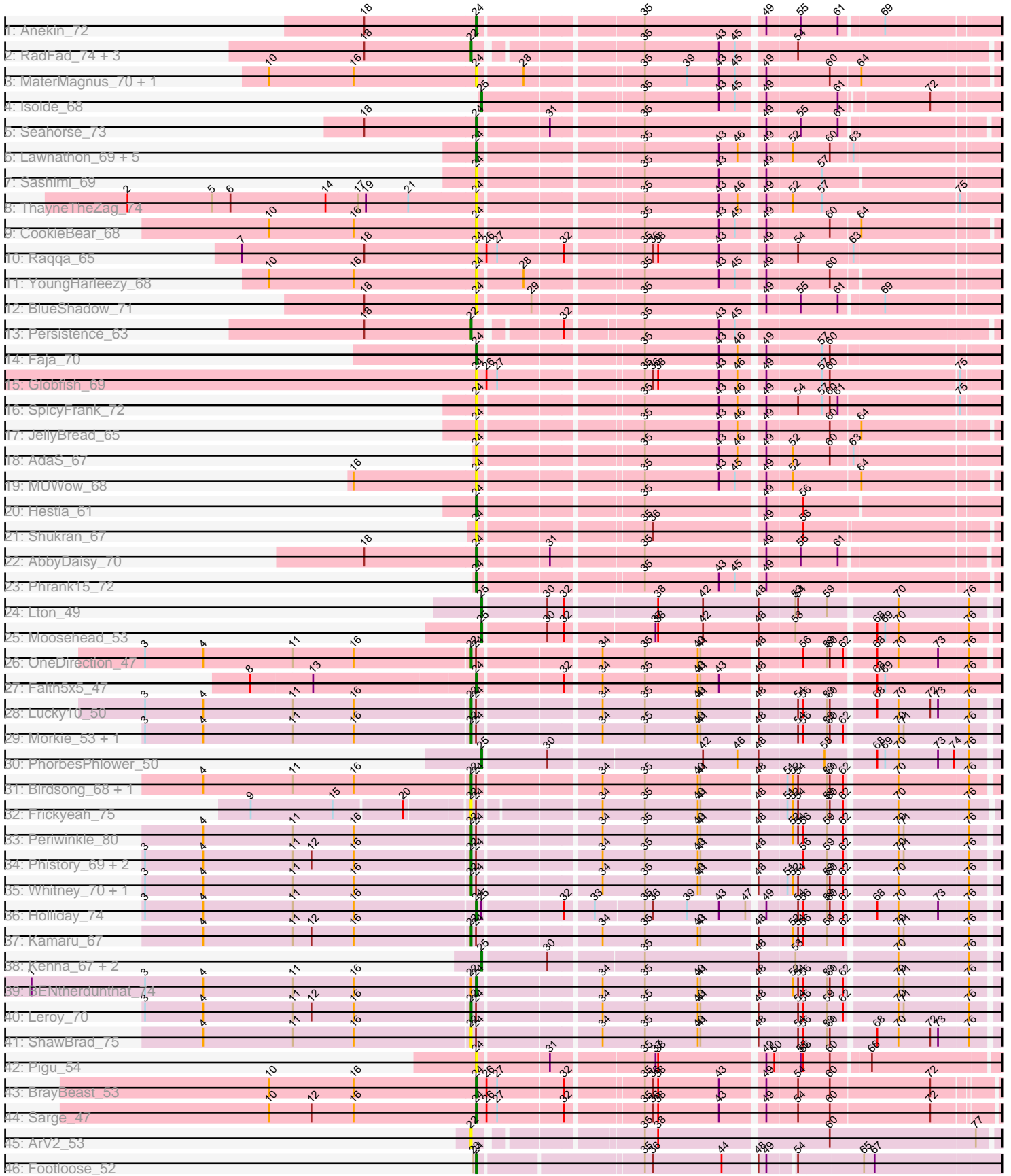


Pham 211097



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 211097 Report

This analysis was run 02/22/25 on database version 588.

Pham number 211097 has 62 members, 23 are drafts.

Phages represented in each track:

- Track 1 : Anekin\_72
- Track 2 : RadFad\_74, Vopal\_71, Hillester\_74, MidnightRain\_72
- Track 3 : MaterMagnus\_70, Aikyam\_68
- Track 4 : Isolde\_68
- Track 5 : Seahorse\_73
- Track 6 : Lawnathon\_69, Windest\_71, BillyTP\_70, Richie\_72, BenchScraper\_69, Raphaella\_69
- Track 7 : Sashimi\_69
- Track 8 : ThayneTheZag\_74
- Track 9 : CookieBear\_68
- Track 10 : Raqqa\_65
- Track 11 : YoungHarleezy\_68
- Track 12 : BlueShadow\_71
- Track 13 : Persistence\_63
- Track 14 : Faja\_70
- Track 15 : Globfish\_69
- Track 16 : SpicyFrank\_72
- Track 17 : JellyBread\_65
- Track 18 : AdaS\_67
- Track 19 : MUWow\_68
- Track 20 : Hestia\_61
- Track 21 : Shukran\_67
- Track 22 : AbbyDaisy\_70
- Track 23 : Phrank15\_72
- Track 24 : Lton\_49
- Track 25 : Moosehead\_53
- Track 26 : OneDirection\_47
- Track 27 : Faith5x5\_47
- Track 28 : Lucky10\_50
- Track 29 : Morkie\_53, Pepperoni\_49
- Track 30 : PhorbesPhlower\_50
- Track 31 : Birdsong\_68, Asapag\_69
- Track 32 : Frickyeah\_75
- Track 33 : Periwinkle\_80
- Track 34 : Phistory\_69, Crater\_70, Apricot\_70
- Track 35 : Whitney\_70, Budski\_75
- Track 36 : Holliday\_74

- Track 37 : Kamaru\_67
- Track 38 : Kenna\_67, Getalong\_73, Lutum\_73
- Track 39 : BENtherdunthat\_74
- Track 40 : Leroy\_70
- Track 41 : ShawBrad\_75
- Track 42 : Pigu\_54
- Track 43 : BrayBeast\_53
- Track 44 : Sarge\_47
- Track 45 : ArV2\_53
- Track 46 : Footloose\_52

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

The start number called the most often in the published annotations is 24, it was called in 16 of the 39 non-draft genes in the pham.

Genes that call this "Most Annotated" start:

- AbbyDaisy\_70, AdaS\_67, Aikyam\_68, Anekin\_72, BENtherdunthat\_74, BenchScraper\_69, BillyTP\_70, BlueShadow\_71, BrayBeast\_53, CookieBear\_68, Faith5x5\_47, Faja\_70, Footloose\_52, Globfish\_69, Hestia\_61, Holliday\_74, JellyBread\_65, Lawnathon\_69, MUWow\_68, MaterMagnus\_70, Phrank15\_72, Pigu\_54, Raphaella\_69, Raqqa\_65, Richie\_72, Sarge\_47, Sashimi\_69, Seahorse\_73, Shukran\_67, SpicyFrank\_72, ThayneTheZag\_74, Windest\_71, YoungHarleezy\_68,

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

- Apricot\_70, Asapag\_69, Birdsong\_68, Budski\_75, Crater\_70, Frickyeah\_75, Kamaru\_67, Leroy\_70, Lucky10\_50, Morkie\_53, OneDirection\_47, Pepperoni\_49, Periwinkle\_80, Phistory\_69, ShawBrad\_75, Whitney\_70,

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

- ArV2\_53, Getalong\_73, Hillester\_74, Isolde\_68, Kenna\_67, Lton\_49, Lutum\_73, MidnightRain\_72, Moosehead\_53, Persistence\_63, PhorbesPhlower\_50, RadFad\_74, Vopal\_71,

**Summary by start number:**

Start 22:

- Found in 23 of 62 ( 37.1% ) of genes in pham
- Manual Annotations of this start: 16 of 39
- Called 95.7% of time when present
- Phage (with cluster) where this start called: Apricot\_70 (DN3), ArV2\_53 (singleton), Asapag\_69 (DN1), Birdsong\_68 (DN), Budski\_75 (DN), Crater\_70 (DN3), Frickyeah\_75 (DN1), Hillester\_74 (AY), Kamaru\_67 (DN1), Leroy\_70 (DN1), Lucky10\_50 (DH), MidnightRain\_72 (AY), Morkie\_53 (DH), OneDirection\_47 (CZ6), Pepperoni\_49 (CZ), Periwinkle\_80 (DN1), Persistence\_63 (AY), Phistory\_69 (DN1), RadFad\_74 (AY), ShawBrad\_75 (DN1), Vopal\_71 (AY), Whitney\_70 (DN1),

Start 24:

- Found in 49 of 62 ( 79.0% ) of genes in pham
- Manual Annotations of this start: 16 of 39

- Called 67.3% of time when present
- Phage (with cluster) where this start called: AbbyDaisy\_70 (AY), AdaS\_67 (AY), Aikyam\_68 (AY), Anekin\_72 (AY), BENtherdunthat\_74 (DN1), BenchScraper\_69 (AY), BillyTP\_70 (AY), BlueShadow\_71 (AY), BrayBeast\_53 (FB), CookieBear\_68 (AY), Faith5x5\_47 (CZ6), Faja\_70 (AY), Footloose\_52 (singleton), Globfish\_69 (AY), Hestia\_61 (AY), Holliday\_74 (DN1), JellyBread\_65 (AY), Lawnathon\_69 (AY), MUWow\_68 (AY), MaterMagnus\_70 (AY), Phrank15\_72 (AY), Pigu\_54 (FB), Raphaella\_69 (AY), Raqqa\_65 (AY), Richie\_72 (AY), Sarge\_47 (FB), Sashimi\_69 (AY), Seahorse\_73 (AY), Shukran\_67 (AY), SpicyFrank\_72 (AY), ThayneTheZag\_74 (AY), Windest\_71 (AY), YoungHarleezy\_68 (AY),

Start 25:

- Found in 8 of 62 ( 12.9% ) of genes in pham
- Manual Annotations of this start: 7 of 39
- Called 87.5% of time when present
- Phage (with cluster) where this start called: Getalong\_73 (DN1), Isolde\_68 (AY), Kenna\_67 (DN1), Lton\_49 (CZ), Lutum\_73 (DN1), Moosehead\_53 (CZ6), PhorbesPhlower\_50 (DH),

### Summary by clusters:

There are 9 clusters represented in this pham: DN, singleton, DH, CZ6, CZ, FB, DN1, DN3, AY,

Info for manual annotations of cluster AY:

- Start number 22 was manually annotated 3 times for cluster AY.
- Start number 24 was manually annotated 10 times for cluster AY.
- Start number 25 was manually annotated 1 time for cluster AY.

Info for manual annotations of cluster CZ:

- Start number 25 was manually annotated 1 time for cluster CZ.

Info for manual annotations of cluster CZ6:

- Start number 22 was manually annotated 1 time for cluster CZ6.
- Start number 24 was manually annotated 1 time for cluster CZ6.
- Start number 25 was manually annotated 1 time for cluster CZ6.

Info for manual annotations of cluster DH:

- Start number 22 was manually annotated 2 times for cluster DH.
- Start number 25 was manually annotated 1 time for cluster DH.

Info for manual annotations of cluster DN:

- Start number 22 was manually annotated 2 times for cluster DN.

Info for manual annotations of cluster DN1:

- Start number 22 was manually annotated 6 times for cluster DN1.
- Start number 24 was manually annotated 2 times for cluster DN1.
- Start number 25 was manually annotated 3 times for cluster DN1.

Info for manual annotations of cluster DN3:

- Start number 22 was manually annotated 2 times for cluster DN3.

Info for manual annotations of cluster FB:

- Start number 24 was manually annotated 2 times for cluster FB.

### **Gene Information:**

Gene: AbbyDaisy\_70 Start: 37654, Stop: 38199, Start Num: 24

Candidate Starts for AbbyDaisy\_70:

(18, 37528), (Start: 24 @37654 has 16 MA's), (31, 37729), (35, 37825), (49, 37954), (55, 37990), (61, 38032),

Gene: AdaS\_67 Start: 34944, Stop: 35498, Start Num: 24

Candidate Starts for AdaS\_67:

(Start: 24 @34944 has 16 MA's), (35, 35112), (43, 35196), (46, 35217), (49, 35241), (52, 35268), (60, 35310), (63, 35334),

Gene: Aikyam\_68 Start: 34815, Stop: 35363, Start Num: 24

Candidate Starts for Aikyam\_68:

(10, 34581), (16, 34677), (Start: 24 @34815 has 16 MA's), (28, 34863), (35, 34983), (39, 35031), (43, 35067), (45, 35085), (49, 35112), (60, 35181), (64, 35214),

Gene: Anekin\_72 Start: 37646, Stop: 38200, Start Num: 24

Candidate Starts for Anekin\_72:

(18, 37520), (Start: 24 @37646 has 16 MA's), (35, 37817), (49, 37946), (55, 37982), (61, 38024), (69, 38069),

Gene: Apricot\_70 Start: 41809, Stop: 42369, Start Num: 22

Candidate Starts for Apricot\_70:

(3, 41443), (4, 41509), (11, 41611), (12, 41632), (16, 41680), (Start: 22 @41809 has 16 MA's), (Start: 24 @41815 has 16 MA's), (34, 41941), (35, 41989), (40, 42049), (41, 42052), (48, 42109), (56, 42157), (59, 42184), (62, 42202), (70, 42256), (71, 42262), (76, 42334),

Gene: ArV2\_53 Start: 29854, Stop: 30420, Start Num: 22

Candidate Starts for ArV2\_53:

(Start: 22 @29854 has 16 MA's), (35, 30016), (38, 30031), (60, 30217), (77, 30379),

Gene: Asapag\_69 Start: 41803, Stop: 42363, Start Num: 22

Candidate Starts for Asapag\_69:

(4, 41503), (11, 41605), (16, 41674), (Start: 22 @41803 has 16 MA's), (Start: 24 @41809 has 16 MA's), (34, 41935), (35, 41983), (40, 42043), (41, 42046), (48, 42103), (51, 42133), (52, 42139), (54, 42145), (59, 42178), (60, 42181), (62, 42196), (70, 42250), (76, 42328),

Gene: BENtherdunthat\_74 Start: 43163, Stop: 43717, Start Num: 24

Candidate Starts for BENtherdunthat\_74:

(1, 42662), (3, 42791), (4, 42857), (11, 42959), (16, 43028), (Start: 22 @43157 has 16 MA's), (Start: 24 @43163 has 16 MA's), (34, 43289), (35, 43337), (40, 43397), (41, 43400), (48, 43457), (52, 43493), (54, 43499), (56, 43505), (59, 43532), (60, 43535), (62, 43550), (70, 43604), (71, 43610), (76, 43682),

Gene: BenchScraper\_69 Start: 36331, Stop: 36885, Start Num: 24

Candidate Starts for BenchScraper\_69:

(Start: 24 @36331 has 16 MA's), (35, 36499), (43, 36583), (46, 36604), (49, 36628), (52, 36655), (60, 36697), (63, 36721),

Gene: BillyTP\_70 Start: 38186, Stop: 38740, Start Num: 24

Candidate Starts for BillyTP\_70:

(Start: 24 @38186 has 16 MA's), (35, 38354), (43, 38438), (46, 38459), (49, 38483), (52, 38510), (60, 38552), (63, 38576),

Gene: Birdsong\_68 Start: 41539, Stop: 42099, Start Num: 22

Candidate Starts for Birdsong\_68:

(4, 41239), (11, 41341), (16, 41410), (Start: 22 @41539 has 16 MA's), (Start: 24 @41545 has 16 MA's), (34, 41671), (35, 41719), (40, 41779), (41, 41782), (48, 41839), (51, 41869), (52, 41875), (54, 41881), (59, 41914), (60, 41917), (62, 41932), (70, 41986), (76, 42064),

Gene: BlueShadow\_71 Start: 36657, Stop: 37211, Start Num: 24

Candidate Starts for BlueShadow\_71:

(18, 36531), (Start: 24 @36657 has 16 MA's), (29, 36714), (35, 36828), (49, 36957), (55, 36993), (61, 37035), (69, 37080),

Gene: BrayBeast\_53 Start: 30531, Stop: 31082, Start Num: 24

Candidate Starts for BrayBeast\_53:

(10, 30297), (16, 30393), (Start: 24 @30531 has 16 MA's), (26, 30543), (27, 30555), (32, 30627), (35, 30705), (36, 30714), (38, 30720), (43, 30789), (49, 30834), (54, 30867), (60, 30903), (72, 31014),

Gene: Budski\_75 Start: 43660, Stop: 44220, Start Num: 22

Candidate Starts for Budski\_75:

(3, 43294), (4, 43360), (11, 43462), (16, 43531), (Start: 22 @43660 has 16 MA's), (Start: 24 @43666 has 16 MA's), (34, 43792), (35, 43840), (40, 43900), (41, 43903), (48, 43960), (51, 43990), (52, 43996), (54, 44002), (59, 44035), (60, 44038), (62, 44053), (70, 44107), (76, 44185),

Gene: CookieBear\_68 Start: 36246, Stop: 36794, Start Num: 24

Candidate Starts for CookieBear\_68:

(10, 36012), (16, 36108), (Start: 24 @36246 has 16 MA's), (35, 36414), (43, 36498), (45, 36516), (49, 36543), (60, 36612), (64, 36645),

Gene: Crater\_70 Start: 42204, Stop: 42764, Start Num: 22

Candidate Starts for Crater\_70:

(3, 41838), (4, 41904), (11, 42006), (12, 42027), (16, 42075), (Start: 22 @42204 has 16 MA's), (Start: 24 @42210 has 16 MA's), (34, 42336), (35, 42384), (40, 42444), (41, 42447), (48, 42504), (56, 42552), (59, 42579), (62, 42597), (70, 42651), (71, 42657), (76, 42729),

Gene: Faith5x5\_47 Start: 32247, Stop: 32810, Start Num: 24

Candidate Starts for Faith5x5\_47:

(8, 32001), (13, 32070), (Start: 24 @32247 has 16 MA's), (32, 32337), (34, 32373), (35, 32421), (40, 32481), (41, 32484), (43, 32505), (48, 32541), (68, 32664), (69, 32673), (76, 32766),

Gene: Faja\_70 Start: 37936, Stop: 38490, Start Num: 24

Candidate Starts for Faja\_70:

(Start: 24 @37936 has 16 MA's), (35, 38104), (43, 38188), (46, 38209), (49, 38233), (57, 38293), (60, 38302),

Gene: Footloose\_52 Start: 30290, Stop: 30850, Start Num: 24

Candidate Starts for Footloose\_52:

(23, 30287), (Start: 24 @30290 has 16 MA's), (35, 30464), (36, 30473), (44, 30551), (48, 30584), (49, 30593), (54, 30620), (65, 30692), (67, 30704),

Gene: Frickyeah\_75 Start: 42944, Stop: 43498, Start Num: 22

Candidate Starts for Frickyeah\_75:

(9, 42710), (15, 42803), (20, 42878), (Start: 22 @42944 has 16 MA's), (Start: 24 @42950 has 16 MA's), (34, 43070), (35, 43118), (40, 43178), (41, 43181), (48, 43238), (51, 43268), (52, 43274), (54, 43280), (59, 43313), (60, 43316), (62, 43331), (70, 43385), (76, 43463),

Gene: Getalong\_73 Start: 44401, Stop: 44958, Start Num: 25

Candidate Starts for Getalong\_73:

(Start: 25 @44401 has 7 MA's), (30, 44470), (35, 44569), (48, 44698), (53, 44737), (70, 44845), (76, 44923),

Gene: Globfish\_69 Start: 37028, Stop: 37594, Start Num: 24

Candidate Starts for Globfish\_69:

(Start: 24 @37028 has 16 MA's), (26, 37040), (27, 37052), (35, 37202), (36, 37211), (38, 37217), (43, 37286), (46, 37307), (49, 37331), (57, 37391), (60, 37400), (75, 37544),

Gene: Hestia\_61 Start: 34159, Stop: 34713, Start Num: 24

Candidate Starts for Hestia\_61:

(Start: 24 @34159 has 16 MA's), (35, 34327), (49, 34456), (56, 34495),

Gene: Hillester\_74 Start: 38114, Stop: 38662, Start Num: 22

Candidate Starts for Hillester\_74:

(18, 37994), (Start: 22 @38114 has 16 MA's), (35, 38279), (43, 38363), (45, 38381), (54, 38441),

Gene: Holliday\_74 Start: 45922, Stop: 46473, Start Num: 24

Candidate Starts for Holliday\_74:

(3, 45550), (4, 45616), (11, 45718), (16, 45787), (Start: 24 @45922 has 16 MA's), (Start: 25 @45928 has 7 MA's), (32, 46012), (33, 46039), (35, 46093), (36, 46102), (39, 46141), (43, 46177), (47, 46207), (49, 46222), (54, 46255), (56, 46261), (59, 46288), (60, 46291), (62, 46306), (68, 46336), (70, 46360), (73, 46405), (76, 46438),

Gene: Isolde\_68 Start: 36363, Stop: 36905, Start Num: 25

Candidate Starts for Isolde\_68:

(Start: 25 @36363 has 7 MA's), (35, 36531), (43, 36615), (45, 36633), (49, 36660), (61, 36738), (72, 36831),

Gene: JellyBread\_65 Start: 35591, Stop: 36139, Start Num: 24

Candidate Starts for JellyBread\_65:

(Start: 24 @35591 has 16 MA's), (35, 35759), (43, 35843), (46, 35864), (49, 35888), (60, 35957), (64, 35990),

Gene: Kamaru\_67 Start: 41724, Stop: 42284, Start Num: 22

Candidate Starts for Kamaru\_67:

(4, 41424), (11, 41526), (12, 41547), (16, 41595), (Start: 22 @41724 has 16 MA's), (Start: 24 @41730 has 16 MA's), (34, 41856), (35, 41904), (40, 41964), (41, 41967), (48, 42024), (52, 42060), (54, 42066), (56, 42072), (59, 42099), (62, 42117), (70, 42171), (71, 42177), (76, 42249),

Gene: Kenna\_67 Start: 41841, Stop: 42398, Start Num: 25

Candidate Starts for Kenna\_67:

(Start: 25 @41841 has 7 MA's), (30, 41910), (35, 42009), (48, 42138), (53, 42177), (70, 42285), (76, 42363),

Gene: Lawnathon\_69 Start: 36731, Stop: 37285, Start Num: 24

Candidate Starts for Lawnathon\_69:

(Start: 24 @36731 has 16 MA's), (35, 36899), (43, 36983), (46, 37004), (49, 37028), (52, 37055), (60, 37097), (63, 37121),

Gene: Leroy\_70 Start: 42140, Stop: 42700, Start Num: 22

Candidate Starts for Leroy\_70:

(3, 41774), (4, 41840), (11, 41942), (12, 41963), (16, 42011), (Start: 22 @42140 has 16 MA's), (Start: 24 @42146 has 16 MA's), (34, 42272), (35, 42320), (40, 42380), (41, 42383), (48, 42440), (54, 42482), (56, 42488), (59, 42515), (62, 42533), (70, 42587), (71, 42593), (76, 42665),

Gene: Lton\_49 Start: 31623, Stop: 32180, Start Num: 25

Candidate Starts for Lton\_49:

(Start: 25 @31623 has 7 MA's), (30, 31692), (32, 31710), (38, 31806), (42, 31857), (48, 31920), (53, 31959), (54, 31962), (59, 31995), (70, 32067), (76, 32145),

Gene: Lucky10\_50 Start: 34323, Stop: 34883, Start Num: 22

Candidate Starts for Lucky10\_50:

(3, 33957), (4, 34023), (11, 34125), (16, 34194), (Start: 22 @34323 has 16 MA's), (Start: 24 @34329 has 16 MA's), (34, 34455), (35, 34503), (40, 34563), (41, 34566), (48, 34623), (54, 34665), (56, 34671), (59, 34698), (60, 34701), (68, 34746), (70, 34770), (72, 34806), (73, 34815), (76, 34848),

Gene: Lutum\_73 Start: 43004, Stop: 43561, Start Num: 25

Candidate Starts for Lutum\_73:

(Start: 25 @43004 has 7 MA's), (30, 43073), (35, 43172), (48, 43301), (53, 43340), (70, 43448), (76, 43526),

Gene: MUWow\_68 Start: 36827, Stop: 37375, Start Num: 24

Candidate Starts for MUWow\_68:

(16, 36689), (Start: 24 @36827 has 16 MA's), (35, 36995), (43, 37079), (45, 37097), (49, 37124), (52, 37151), (64, 37226),

Gene: MaterMagnus\_70 Start: 36987, Stop: 37535, Start Num: 24

Candidate Starts for MaterMagnus\_70:

(10, 36753), (16, 36849), (Start: 24 @36987 has 16 MA's), (28, 37035), (35, 37155), (39, 37203), (43, 37239), (45, 37257), (49, 37284), (60, 37353), (64, 37386),

Gene: MidnightRain\_72 Start: 37900, Stop: 38448, Start Num: 22

Candidate Starts for MidnightRain\_72:

(18, 37780), (Start: 22 @37900 has 16 MA's), (35, 38065), (43, 38149), (45, 38167), (54, 38227),

Gene: Moosehead\_53 Start: 32750, Stop: 33310, Start Num: 25

Candidate Starts for Moosehead\_53:

(Start: 25 @32750 has 7 MA's), (30, 32819), (32, 32837), (37, 32930), (38, 32933), (42, 32984), (48, 33047), (53, 33086), (68, 33170), (69, 33179), (70, 33194), (76, 33272),

Gene: Morkie\_53 Start: 33852, Stop: 34412, Start Num: 22

Candidate Starts for Morkie\_53:

(3, 33486), (4, 33552), (11, 33654), (16, 33723), (Start: 22 @33852 has 16 MA's), (Start: 24 @33858 has 16 MA's), (34, 33984), (35, 34032), (40, 34092), (41, 34095), (48, 34152), (54, 34194), (56, 34200), (59, 34227), (60, 34230), (62, 34245), (70, 34299), (71, 34305), (76, 34377),

Gene: OneDirection\_47 Start: 31245, Stop: 31805, Start Num: 22

Candidate Starts for OneDirection\_47:



(3, 30879), (4, 30945), (11, 31047), (16, 31116), (Start: 22 @31245 has 16 MA's), (Start: 24 @31251 has 16 MA's), (34, 31377), (35, 31425), (40, 31485), (41, 31488), (48, 31545), (56, 31593), (59, 31620), (60, 31623), (62, 31638), (68, 31668), (70, 31692), (73, 31737), (76, 31770),

Gene: Pepperoni\_49 Start: 33008, Stop: 33568, Start Num: 22

Candidate Starts for Pepperoni\_49:

(3, 32642), (4, 32708), (11, 32810), (16, 32879), (Start: 22 @33008 has 16 MA's), (Start: 24 @33014 has 16 MA's), (34, 33140), (35, 33188), (40, 33248), (41, 33251), (48, 33308), (54, 33350), (56, 33356), (59, 33383), (60, 33386), (62, 33401), (70, 33455), (71, 33461), (76, 33533),

Gene: Periwinkle\_80 Start: 45304, Stop: 45864, Start Num: 22

Candidate Starts for Periwinkle\_80:

(4, 45004), (11, 45106), (16, 45175), (Start: 22 @45304 has 16 MA's), (Start: 24 @45310 has 16 MA's), (34, 45436), (35, 45484), (40, 45544), (41, 45547), (48, 45604), (52, 45640), (54, 45646), (56, 45652), (59, 45679), (62, 45697), (70, 45751), (71, 45757), (76, 45829),

Gene: Persistence\_63 Start: 35457, Stop: 36002, Start Num: 22

Candidate Starts for Persistence\_63:

(18, 35337), (Start: 22 @35457 has 16 MA's), (32, 35541), (35, 35619), (43, 35703), (45, 35721),

Gene: Phistory\_69 Start: 41369, Stop: 41929, Start Num: 22

Candidate Starts for Phistory\_69:

(3, 41003), (4, 41069), (11, 41171), (12, 41192), (16, 41240), (Start: 22 @41369 has 16 MA's), (Start: 24 @41375 has 16 MA's), (34, 41501), (35, 41549), (40, 41609), (41, 41612), (48, 41669), (56, 41717), (59, 41744), (62, 41762), (70, 41816), (71, 41822), (76, 41894),

Gene: PhorbesPhlower\_50 Start: 32807, Stop: 33364, Start Num: 25

Candidate Starts for PhorbesPhlower\_50:

(Start: 25 @32807 has 7 MA's), (30, 32876), (42, 33041), (46, 33080), (48, 33104), (58, 33176), (68, 33227), (69, 33236), (70, 33251), (73, 33296), (74, 33314), (76, 33329),

Gene: Phrank15\_72 Start: 37310, Stop: 37858, Start Num: 24

Candidate Starts for Phrank15\_72:

(Start: 24 @37310 has 16 MA's), (35, 37478), (43, 37562), (45, 37580), (49, 37607),

Gene: Pigu\_54 Start: 29678, Stop: 30238, Start Num: 24

Candidate Starts for Pigu\_54:

(Start: 24 @29678 has 16 MA's), (31, 29753), (35, 29849), (37, 29861), (38, 29864), (49, 29978), (50, 29987), (55, 30014), (56, 30017), (60, 30047), (66, 30086),

Gene: RadFad\_74 Start: 38114, Stop: 38662, Start Num: 22

Candidate Starts for RadFad\_74:

(18, 37994), (Start: 22 @38114 has 16 MA's), (35, 38279), (43, 38363), (45, 38381), (54, 38441),

Gene: Raphaella\_69 Start: 36429, Stop: 36983, Start Num: 24

Candidate Starts for Raphaella\_69:

(Start: 24 @36429 has 16 MA's), (35, 36597), (43, 36681), (46, 36702), (49, 36726), (52, 36753), (60, 36795), (63, 36819),

Gene: Raqqa\_65 Start: 34745, Stop: 35305, Start Num: 24

Candidate Starts for Raqqa\_65:

(7, 34481), (18, 34619), (Start: 24 @34745 has 16 MA's), (26, 34757), (27, 34769), (32, 34841), (35, 34919), (36, 34928), (38, 34934), (43, 35003), (49, 35048), (54, 35081), (63, 35141),

Gene: Richie\_72 Start: 38234, Stop: 38788, Start Num: 24

Candidate Starts for Richie\_72:

(Start: 24 @38234 has 16 MA's), (35, 38402), (43, 38486), (46, 38507), (49, 38531), (52, 38558), (60, 38600), (63, 38624),

Gene: Sarge\_47 Start: 28278, Stop: 28829, Start Num: 24

Candidate Starts for Sarge\_47:

(10, 28044), (12, 28092), (16, 28140), (Start: 24 @28278 has 16 MA's), (26, 28290), (27, 28302), (32, 28374), (35, 28452), (36, 28461), (38, 28467), (43, 28536), (49, 28581), (54, 28614), (60, 28650), (72, 28761),

Gene: Sashimi\_69 Start: 37351, Stop: 37905, Start Num: 24

Candidate Starts for Sashimi\_69:

(Start: 24 @37351 has 16 MA's), (35, 37519), (43, 37603), (49, 37648), (57, 37708),

Gene: Seahorse\_73 Start: 38791, Stop: 39336, Start Num: 24

Candidate Starts for Seahorse\_73:

(18, 38665), (Start: 24 @38791 has 16 MA's), (31, 38866), (35, 38962), (49, 39091), (55, 39127), (61, 39169),

Gene: ShawBrad\_75 Start: 42460, Stop: 43020, Start Num: 22

Candidate Starts for ShawBrad\_75:

(4, 42160), (11, 42262), (16, 42331), (Start: 22 @42460 has 16 MA's), (Start: 24 @42466 has 16 MA's), (34, 42592), (35, 42640), (40, 42700), (41, 42703), (48, 42760), (54, 42802), (56, 42808), (59, 42835), (60, 42838), (68, 42883), (70, 42907), (72, 42943), (73, 42952), (76, 42985),

Gene: Shukran\_67 Start: 35241, Stop: 35786, Start Num: 24

Candidate Starts for Shukran\_67:

(Start: 24 @35241 has 16 MA's), (35, 35409), (36, 35418), (49, 35538), (56, 35577),

Gene: SpicyFrank\_72 Start: 37649, Stop: 38206, Start Num: 24

Candidate Starts for SpicyFrank\_72:

(Start: 24 @37649 has 16 MA's), (35, 37817), (43, 37901), (46, 37922), (49, 37946), (54, 37979), (57, 38006), (60, 38015), (61, 38024), (75, 38156),

Gene: ThayneTheZag\_74 Start: 37312, Stop: 37872, Start Num: 24

Candidate Starts for ThayneTheZag\_74:

(2, 36919), (5, 37015), (6, 37036), (14, 37144), (17, 37180), (19, 37189), (21, 37237), (Start: 24 @37312 has 16 MA's), (35, 37480), (43, 37564), (46, 37585), (49, 37609), (52, 37636), (57, 37669), (75, 37822),

Gene: Vopal\_71 Start: 39582, Stop: 40130, Start Num: 22

Candidate Starts for Vopal\_71:

(18, 39462), (Start: 22 @39582 has 16 MA's), (35, 39747), (43, 39831), (45, 39849), (54, 39909),

Gene: Whitney\_70 Start: 43573, Stop: 44133, Start Num: 22

Candidate Starts for Whitney\_70:

(3, 43207), (4, 43273), (11, 43375), (16, 43444), (Start: 22 @43573 has 16 MA's), (Start: 24 @43579 has 16 MA's), (34, 43705), (35, 43753), (40, 43813), (41, 43816), (48, 43873), (51, 43903), (52, 43909), (54, 43915), (59, 43948), (60, 43951), (62, 43966), (70, 44020), (76, 44098),

Gene: Windest\_71 Start: 35789, Stop: 36343, Start Num: 24

Candidate Starts for Windest\_71:

(Start: 24 @35789 has 16 MA's), (35, 35957), (43, 36041), (46, 36062), (49, 36086), (52, 36113), (60, 36155), (63, 36179),

Gene: YoungHarleezy\_68 Start: 36644, Stop: 37195, Start Num: 24

Candidate Starts for YoungHarleezy\_68:

(10, 36410), (16, 36506), (Start: 24 @36644 has 16 MA's), (28, 36692), (35, 36812), (43, 36896), (45, 36914), (49, 36941), (60, 37010),